MARINE REVIEW.

VOL. VII. CLEVELAND, OHIO, THURSDAY, FEBRUARY 16, 1893. No. 7.

Canadian Canal Tolls.

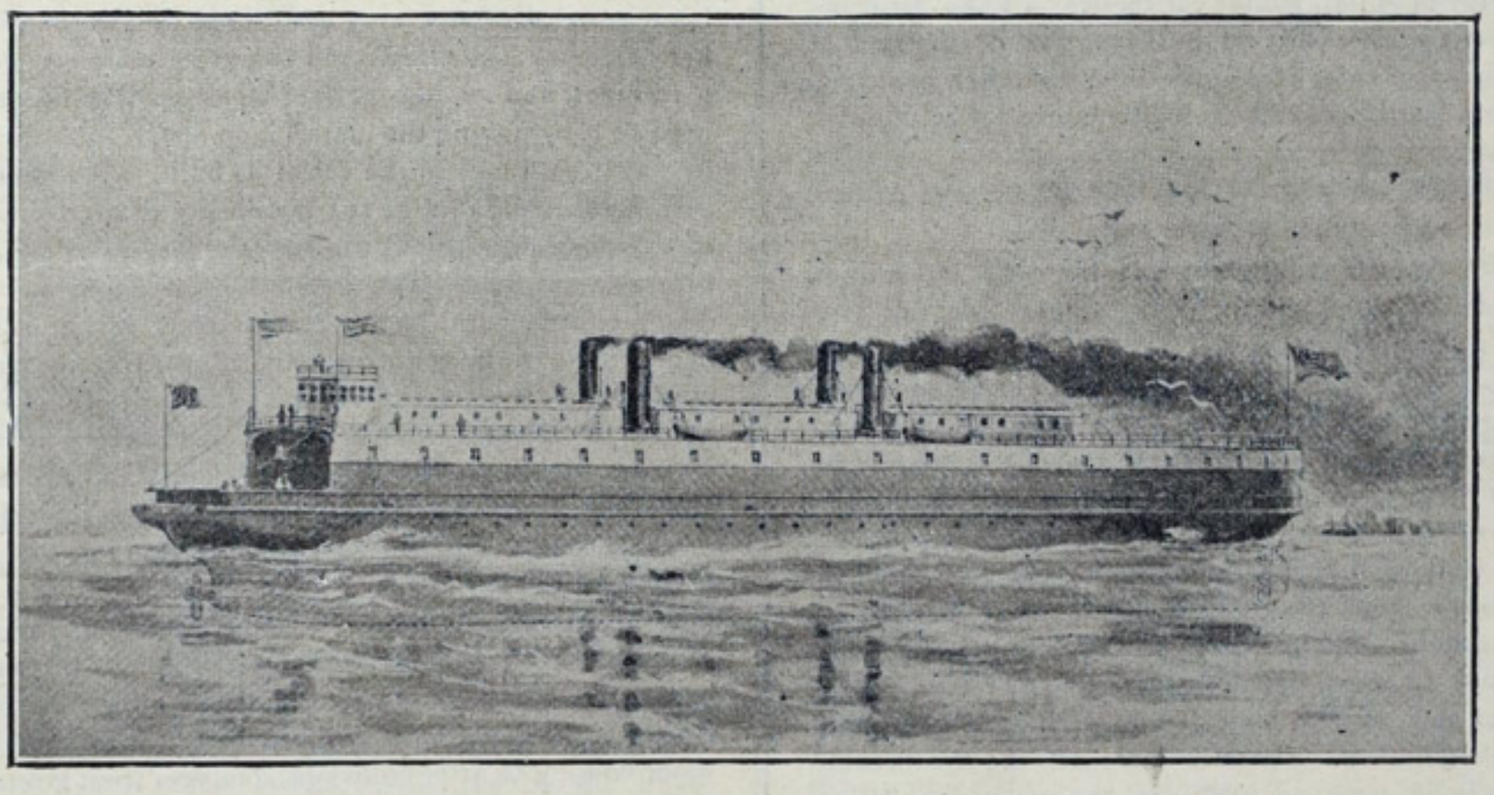
Another report of a settlement of the Canadian canal tolls question for 1893 is given out by the Official Gazette of Ottawa. Canal tolls for the following food products are announced: "Wheat, Indian corn, peas, barley, rye, oats, flaxseed and buckwheat for passage eastward through the Welland canal will be 10 cents per ton, and for passage eastward through the St. Lawrence canals 10 cents per ton also; the payment of said toll of 10 cents per ton for passage through the Welland canal to entitle these products to free passage through the St. Lawrence canals." Such an arrangement as this would probably be acceptable to the United States government. In the past all grain which was not carried through to Montreal had to pay 20 cents per ton. This discriminated against Ogdensburg, N. Y., the rebate of tolls on shipments to Montreal being 18 cents per ton. According to the proposed new arrangement, American grain loaded at Ogdensburg will pay only 10 cents per ton. All grain going through to Montreal will pay the same rate.

Thickness of Ice and Depth of Water at the Sault.

UNITED STATES ENGINEER OFFISE,
SAULT STE. MARIE, Mich., Feb, 14, 1893.

EDITOR MARINE REVIEW: Your request to Assistant Engineer E. S. Wheeler for information relative to thickness of ice and depth of water at the canal has been received. The mean stage of water during the month of January for the past six years has been as follows:

	Available water on breast wall, upper lock gates. Feet.	Available water on platform, lower lock gates. Feet.
Jan. 1888	14.432	15.187
" 1889	14.828	15.664
" 1890	14.784	15.889
" 1891	14.162	14.995
" 1892	14.315	14.418
" 1893	14.089	13.885



CAR FERRY STEAMER STE. MARIE, FOR STRAITS OF MACKINAC.
See Detroit Correspondence, page 6.

Sales of Vessel Property.

Transfers of vessels are still being made in all parts of the lakes, and the aggregate value of boats sold since the close of navigation is now close to $1,750,000. Sales of the past week are:

Steamer W. B. Morley, Morley estate of Marine City, Mich., to J. H. Clauss of Fremont, O., and John Warner and others of Cleveland, $110,000; lumber steamer under construction, James Davidson, West Bay City, Mich., to Ketcham Lumber Company and Capt. James Calbick of Chicago, and Capt. W. J. Carter of Milwaukee, $90,000; steamer Nahant, James Wallace and others to Capt. C. E. Benham of Cleveland, private terms; steamer Sachem, Frank M. Thompson of Detroit and Capt. Daniel Nelson of Milwaukee to Edward E. Ayer of Chicago, $50,000; schooner Scotia, Moss National Bank of Sandusky to Young Transportation Company of Bay City, price said to be $25,000; schooner Dashing Wave, J. V. Lutts and others to J. M. Jones & Co. of Detroit, $2,600; tug J. S. Blazier, Wickham & Co. of Huron, O., to Toledo parties, consideration private.

The steamer purchased by the Ketcham Lumber Company and others of Chicago from Capt. Davidson will be a single deck boat, apecially designed for lumber, of which she will carry about 1,200,000 feet. She is 243 feet long and will be fitted with triple expansion engines. Since the close of navigation, Capt. Davidson has sold six vessels.

The lowest water thus far during this month was on the 14th inst. The comparison for previous years is as follows:

	Available water on breast wall, upper lock gates. Feet.	Available water on platform, lower lock gates. Feet.
Feb. 14, 1888	14.401	15.267
" 1889	14.211	15.414
" 1890	14.556	15.767
" 1891	14.131	15.087
" 1892	14.742	14.667
" 1893	13.582	13.567

On account of the depth of snow, the ice in the canal is not quite as thick as usual at this season of year. I have just finished a survey of the Mud lake shoal, located about half way between the Mill dock and the can buoy. The ice was from 16 to 36 inches thick, and the snow on the ice from one to three feet deep.

JOSEPH RIPLEY, Assistant Engineer.
(In absence of Asst. Engr. E. S. Wheeler.)

There were on June 30, 1892, thirty-six light-vessels in service under the direction of the United States light-house establishment. The total number of all kinds of aids to navigation maintained by this service on the same date was 7,775, or an increase of 194 over 1891.

Some Buffalo Appointments.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., Feb. 16.—Manager Gordon of the Lehigh and Northern lines has opened the season by announcing the following appointments of masters: Lehigh line—Saranac, J. M. Todd; E. P. Wilbur, J. A. Brown; Tuscarora, M. H. Murch; Seneca, G. E. McCullough; Cayuga, not yet selected; Tacoma, William Williams; Clyde, A. J. Talbot; Oceanica, D. Driscoll; Fred Mercur, T. Rahill; H. E. Packer, James Todd; R. A. Packer, George McMinn. Northern line—Northern King, W. H. Campau; Northern Queen, E. M. Smith; North Wind, Delos Waite; Northern Wave, Martin Niland; North Star, William Thorne; Northern Light, M. J. Haberer. These are substantially all re-appointments. There are, however, a few transfers. Quite a large force is at work on the Lehigh boats, overhauling machinery, etc. The Tacoma and Clyde will be given pole masts. The project to give all the wooden boats the same rig has been given up.

There is still further evidence of the good opening lumber rates, already announced. The Ed Smith, No. 1 and tow have a season contract from Duluth and Ashland to Tonawanda and the George King tow has the same for two trips, at a rate said to be $2.50.The Shrigley will tow two of the Hebard fleet, consisting of the Wilson, Aloha, Peterson and Brink, and the Charles Hebard the others in the Pequaming lumber trade to Buffalo at going rates.

Buffalo mourns the death of Capt. Levi Allen, who died on Sunday at the age of ninety-one. He lived here when the place was burned in 1813 and was an officer on the Walk-in-the-Water, the first lake steamer, when she was wrecked. He was collector of the port under President Zackary Taylor. He built the Buffalo and Niagara, famous side-wheelers of their day, and commanded several other vessels.

These are the days when vesselmen are enjoying themselves. Manager Caldwell of the Western line went to Europe last week, Capt. J. J. H. Rrown has gone to Madeira, Capt. John Green is wintering in California, Capt. George McLeod is in Florida and John L. Crosthwaite goes to Cuba this week.

The publication of the project to put winter car ferries on Lake Erie between Toledo and Buffalo does not astonish Freight Agent Fell of the Lackawanna. He was one of the first advocates of it and has no hesitation in saying that he expects to see it done. But it looks like a wild venture for all that.

A Duplicate of the E. C. Pope

Special Correspondence to the MARINE REVIEW.

DETROIT, Mich., Feb. 16.—The REVIEW gives an interesting bit of news in annonncing that the Detroit Dry Dock Company will build for the Dry Dock Navigation Company, a duplicate of the E. C. Pope, the most successful freight carrier brought out in 1891, and still holding the cargo record on grain and coal, but surpassed in iron ore by a larger boat. She was so successful that with the single exception of the adoption of forced draught there will be no departure in the new boat from her original. The addition of Howden's forced draught to the boilers of the new boat will give her more speed than the Pope, and it is generally claimed that she could take care of her laurels in a company of flyers. The Pope's cargo records are as follows: Corn, on 14 feet 8 inches draft, 125,730 bushels; iron ore, 16 feet draft, 3,239 tons gross, 3,628 tons net; coal, Buffalo to Chicago, 3,950 tons. The new boat will be 337 feet over all, 42 feet beam and 24 feet hold. The engines will be triple expansion 22, 35 and 56-inch cylinders. She will have all the features of convenience contained in the Pope, such as hooks in the stern for lifting broken buckets from the wheel and a bottom constructed on a longitudinal plan, so that she can be listed when it is desired.

Preparations are being made today (Thursday), for launching the greatest ice-crushing ferry boat in this country, if not in the world, from the Orleans street yard of the Detroit Dry Dock Company. At present the St. Ignace has that honor, but as the new boat, which will be called Ste. Marie, is nearly one-fourth longer and will have one-third more power, there is no doubt of her doing even better than the boat that has carried cars across the Straits of Mackinaw through ice from three to five feet thick in winter for the past five years. The Michigan Central, the Duluth, South Shore & Atlantic, and the Grand Rapids & Indiana Railway Companies are the owners of these boats. The contract price of the Ste. Marie is said to be $325,000. She will differ in appearance from the St. Ignace only in having the deck on which the cars are carried housed in. Her molded length on deck is 302 feet, four car lengths longer than the St. Ignace; breadth of beam, molded, 50½ feet; keel, 269½ feet; depth, molded, 24 feet; speed 15 miles an hour with an eighteen freight car carrying capacity, or seven cars more than the St. Ignace handles. There will be a propeller in each end, which will be turned by separate inverted compound engines having 4,000 horse-power. Four double-ended boilers will furnish steam to the main engines and the twenty or more auxiliary engines. The cylinders of the forward engine are 28 and 52 inches in diameter, with 40-inch stroke, and the cylinders of the after engine are 32 and 58 inches diameter, with a 48-inch stroke. The forward propeller is 10½ feet in diameter and the after propeller 12 feet in diameter. The four boilers have a mean diameter of 11 feet 6 inches and a length of 18 feet, with a working pressure of 120 pounds to the square inch. The boat is unusually heavy in construction and is said to contain about 2,000,000 feet of oak. The turn of the bilge is protected by short frames that extend to the water line, so that the lower portion of the hull is almost a continuous mass of frame-work. The outside planking is of 4-inch oak and there are four inside or stringer keelsons. For the whole length of the boat and from water-line to keel, there is plating of quarter-inch steel, to prevent damage from ice. Her capability for an Arctic voyage has been mentioned, and in connection with the newspaper talk about provisional war vessels on the lakes it might be well to note that if such a necessity should arise, this ice-crusher would be the most formidable craft in this section for mounting guns on deck.

The first of the two side-wheel passenger boats for the Lake Huron division of the Detroit & Cleveland line will, if the weather permits of regular work, be launched in about three weeks. Work on the New York Central boat is going forward as fast as possible, and the straightback Selwyn Eddy is receiving the finishing touches at the Orleans street yard.

Not Favorable to Cellulose.

Special Correspondence to the MARINE REVIEW.

WASHINGTON, D. C., Feb. 16.—The use of cellulose as a water-excluding material in our new ships will probably be abandoned by the navy department. It was intended for nse first in the cruiser New York, but Capt. Phillips, who will command that vessel, has secured a change of plans. He suggested that the plan be abandoued for the present and that the material intended for the New York be packed in bags and be stored away where it could be instantly had should the big cruiser ever have occasion to give test to her prowess as a fighting machine with some fighting adversary, when the material could be placed in her cofferdams and a practical trial be given of its obdurating properties. Many of the ships now building were planned with a view to using cellulose, and should Capt. Phillips' suggestion be approved by the secretary it is highly probable that in future each ship will be provided with the requisite quantity of the bulky material, but not to be placed on board unless the country is in imminent danger of calling upon the navy for action. Capt. Phillips argues, as do many others, that there is no occasion of burdening a vessel with any more additional weight than is absolutely necessary for her efficiency and safety, and to put in cellulose would only increase the displacement, and its object could be as readily accomplished when there was need of it by having the material on shore in the navy yards in easy reach as by putting it in when the vessel is built. Another argument in favor of this plan is the avoidance of any possibility of corrosion or rust to the ship, which some say would result if the material was allowed to remain in the cofferdams for any great time. The action of the department in the matter will, no doubt, be influenced by the recent trials given cellulose by foreign navies. While some of the countries have adopted it, Germany has come to the conclusion that its efficiency has yet to be proved and has abandoned its use in her ships. France has likewise looked askance at its adoption and England is not over-enthusiastic regarding it. The Austrian experiments have resulted adversely, and a substitute as an obdurating material is now being searched for. The most rigid and successful trial given cellulose was made by little Denmark, and the results showed conclusively the value of the material as a water-excluding substance. The experiments conducted by our naval experts at Indian Head demonstrated that the use of this material would aid greatly in saving a vessel should she be struck where the water would gain access. No attempt has yet been made to utilize it in merchant ships to prevent the water coming in after collisions, damages from grounding or other causes. As it is generally regarded in such cases, the force would be so great as to seriously damage the cofferdams and thus render the cellulose ineffective.

Personal Mention.

Mack, Nye & Co. is the firm name adopted by Messrs. W. E. Mack and H. B. Nye who have formed a partnership in the ore sales business.

Mr. F. W. Wheeler of West Bay City and Capt. J. S. Dunham of Chicago were in Cleveland Wednesday. Mr. Wheeler was on his way to Washington.

Messrs. Harry J. Cornish, London, and Samuel J. P. Thearle, Glasgow, surveyors to Lloyd's Register who have come from England to gather information relative to lake shipping, will be in Detroit during the latter part of the present week.

At a banquet given recently by the United States Standard Steamship Owners' Builders' and Underwriters' Association, Edward C. O'Brien, United States commissioner of navigation, delivered a short but very interesting address on the shipping interests of the United States. The address has been printed and a copy of it may be had from the commissioner.

Mr. E. T. Evans, western manager of the Erie & Western Transportation Company (Anchor Line), announces that Mr. Chas. E. Markham, formerly general passenger agent of the Lake Superior Transit Company, which company has ceased active operations, has been appointed General Passenger Agent of the Anchor Line, with offices at Atlantic dock, Buffalo, N. Y.

Menominee and Mutual Appointments.

Appointments of captains for the steel steamers of the Menominee and Mutual lines of Cleveland are as follows: Menomine line—Norman, Capt. S. Stratton; Saxon, Capt. William C. Goodsell; German, Capt. F. W. Stenton; Briton, Capt. A. C. Chapman; Grecian, Capt. James A. Walsh; Roman, A. J. Greenley. Mutual line—Corsica, Capt. William Cumming; Corona, Capt. John Dunn; Cambria, Capt. S. Murphy. The new men for next season in these lines, which are under one management, are Capt. A. C. Chapman and Capt. William C. Goodsell. Capt. Chapman left the Menominee fleet last season to look after wrecking matters at Sault Ste. Marie for the American Steel Barge Company, but he will return to sailing again, and as far as can be learned, his successor in the wrecking work has not as yet been appointed. Capt. Goodsell is promoted to the Saxon from the Sparta, one of the Orient line steamers, which are also managed in the office of M. A. Hanna & Co.

Another Keel Laid.

At Morley's yard, Marine City, the work of putting down another wooden boat was begun this week. The boat is for M. Sicken and others of Marine City, and will be a lumber steamer of 200 feet keel, 36 feet beam and 14 feet hold. She will be a single decker and ought to carry nearly 1,000,000 feet. It is expected that this class of boat will find a profitable business in the Lake Superior lumber trade for some time to come. The contract for machinery has not been let as yet.

Taxation of Vessel Property.

The question of taxation of vessel property is at present receiving attention in some Atlantic coast cities as well as on the lakes. The current issue of the Maritime Register of New York contains the following very able article on the subject:

"The question of taxation of shipping is one that agitates certain states about assessment season every year. Bitter feelings are engendered and predictions of dire calamity following upon the visit of the assessor are frequent. It is, however, a matter that honestly viewed ought to be settled at once and forever. Logically, equitably, and in justice, local taxation should have nothing to do with the value of a vessel. It should concern itself only with the earnings and only with that part of them belonging to the residents of the locality. In the two widely separated cities of Bath, Me., and Detroit, Mich., this matter is now being hotly discussed, but if the cities are at all wise there would be only one settlement of the case. In a town whose people are largely shareholders in vessel property and whose principal business interests are centered in trades pertaining to shipping, it seems to have been considered just that the shipowner as the representative of the chief industry of the town should be taxed upon the value of his ship property. From this taxable source came the chief municipal revenue. It offered the easiest and best source of income. It simply followed the rule adopted the world over in regard to the ship. Tax it, or charge it, the first as being an easy way of raising money, whether the charge be just or not. As long as dividends were fair and shipping continued in a reasonably prosperous condition, no very strong protest was made against this form of taxation. The tax was not very heavy and it might as well take this form as another. An easy slipshod way of evading a difficult question. That the system had no equity in it and really bore more severely upon one class than another was never considered. As the measure of protection is the same for all, poor and rich, the measure of taxation should be as justly proportioned. But in local taxes upon vessel value it is not so measured. Vessel owners in places where this old system still exists are now finding this out.

"It would seem almost unnecessary to point out again what is so manifest that the town or city gives no protection, no assistance, no help in any way to the vessel, even though the vessel may be owned entirely in the town, and even though she sails to and from there. As far as the vessel itself is concerned, in paying port charges, wharfage, anchorage dues or the thousand and one ways in which a vessel is mulcted in a port, it pays its proportion of taxes, the length of protection being covered by frequent payments, according to number of trips. If none of these charges is made, it is because it is considered of greater advantage to make the port cheap, loss of income in this direction being more than made up by increase of trade brought by the vessel. The vessel of itself, is therefore taxed or not, indirectly to be sure, as the town sees fit. Now, as to the money value of the vessel which the owner is supposed to have. This represents no amount contained within the town. It is no more to the town than the house which the vessel owner may own in another state, and which no local tax board in its wildest desires would think of taxing. It is a piece of personal property which receives whatever protection property may from the national government. Its ability to trade, its very existence it may be said, is due to the permission of the national government whose flag it sails under and whose register of baptism it takes. The town does not help it or hinder it in any way. Even the value of it the town cannot fairly determine,for this must depend upon considerations beyond the control of local influences. As far as the owner personally is concerned he pays his proportion of town expenses through his rent, or real estate tax, and the purchases for subsistence which he makes in the town. That the income from his property should be taxed must be admitted. The income from his vessels comes in this category and it is only this part of the vessel that town taxations should touch.

"It is certain that any other view of vessel taxation than that here set forth will injure the town making it, in so far as holdings of vessel property there are concerned. To tax the value will send large holders of vessel property to other places where more equity in taxation obtains. And it will drive away from shipping investments small holders, who can illy stand a tax upon what may be scarcely a paying venture. Freedom from such taxation will keep vessel property in a place, tend to greater increase in the amount of such holdings, and by bringing more money into the town cause local improvements that will offer a better, because more legitimate, field for taxation."

Do You Want a Photograph of Your Steamer?

To accommodate subscribers who are anxious to secure photographs of lake steamers in which they are in any way interested the MARINE REVIEW has made a collection and is able to furnish 7x9 photographs, well-mounted, of the following steamers at $1 each. Write to the MARINE REVIEW, 516 Perry-Payne building, Cleveland, O.:

Arabia,
America,
Averell, W. J.,
Avery, Waldo A.,
Alaska,
Albany,
Atlanta,
Argonaut,
Boyce. Mary H.,
Boscobel,
Baldwin, S. C.,
Buffalo,
Boston,
Bieleman, C. F.,
City of Duluth,
City of Rome,
Caledonia,
City of Ludington,
City of Racine,
Cayuga,
City of Fremont,
City of Naples,
Chemung,
Clarion,
Conemaugh,
Conestoga,
Chicago (Goodrich Line),
Chicago (West'n Tr. Co.),
City of Traverse,
City of Paris,
Codorus,
Donaldson, Jas. P.,
Eddy, John F.,
Egan, W. M.,
Eddy, C. A.,
Fayette,
Foster, Parks,
Florida,
Flower, R. P.,
Gilcher, W. H.,
Gogebic,
Grecian,
Gladstone,
Grover, M. B.,
Gilchrist, J. C.,
Harlem,
Helena,
Haskell, W. J.,
Hall, John E.,
Hudson,
Hurd, Jos. L.,
Italia,
Indiana,
Ionia,
Juniata,
James, H. R.,
Jewett, H. J.,
Langdon, Jas. R..
Lackawanna,
Louisianna,
Lehigh,
Lycoming,
Lawrence,
Manola,
Maruba,
McVittie, A.,
Masaba,
Maryland,
Marina,
Mather, Sam'l (whaleb'k)
Maytham, Thos.,
Manchester,
Merrimac,
Minnesota,
Manhattan,
Massachusetts,
Marshall, Sam'l,
Mills, Rob't,
Milwaukee,
Mahoning,
Neosho,
New York,
Northern King,
North Wind,
Owen, J. Emory,
Owego,
Owen, Ira H.,
Onoko,
Portage.
Palmer, Thos. W.,
Packer, R. A.,
Petoskey,
Peerless,
Parnell, C. S.,
Philadelphia,
Prince, F. H.,
Perrett, J. C.,
Pathfinder (whaleback),
Panther,
Pillsbury (engines),
Pontiac,
Rochester,
Rosedale,
Rugee, John,
Russia,
Smith, Gov.,
Saranac,
Syracuse,
Susquehanna,
Seneca,
Sachem,
Smith, Ed.,
Schuyikill,
St.Lawrence, (do engines)
Scranton,
Sheboygan,
Shaw, John (schooner),
Tilley, Sir S. L.,
Tacoma,
Tuscarora,
Thomson, A.D., (whaleb'k)
Tioga,
Uganda (engines),
Viking,
Virginia,
Vance, F. L.,
Wheeler, F. W.,
Wyoming,
Williams, George F.,
Wisconsin,
Wissahickon,
Wilbur, E. P.,
Westcott, J. W.,
Washburn,

Lake Carriers' Association.

M. A. BRADLEY. President.

VICE-PRESIDENTS: James W. Millen, Detroit, Mich. — John G. Keith, Chicago, Ill.; Frank J. Firth, Erie, Pa. — W. S. Brainard, Toledo, O.; Thomas Wilson, Cleveland, O. — R. P. Fitzgerald, Milwaukee, Wis.; Peter F. Miller, Buffalo, N.Y. — Alex. McDougall, Duluth, Minn.

Charles H. Keep, Secretary, Buffalo, N.Y. Geo. P. McKay, Treasurer, Cleveland, O.
Harvey D. Goulder, Counsel, Cleveland, O.

AGAINST BRIDGES AT THE HEAD OF THE LAKES.

A strong effort is again being made to secure the passage of a bill in congress permitting of the construction of a bridge at Connor's point and Rice's point, St. Louis bay. Municipal authorities of Duluth and a large portion of the citizens of Superior are favorable to the measure, and at the meeting of the finance committee of the association on Monday it was announced that Capt. Alex. McDougall, who as a vessel owner has all along opposed the construction of bridges at the head of the lakes, is now in favor of a bridge at the point named, but stipulates that it should be 20 feet high in the clear and not less than 200 feet in the draw. It was shown, however, that Gen. Casey, chief of government engineers, repeats to the present congress strong objections to the bridge, and the association decided that it could not recommend a bridge of any kind, in the face of the war department report, but added that a bridge including all kinds of traffic and 20 feet high with 200 feet in the clear is desirable when any bridge is authorized.

FOR WIDENING "COLLISION BEND" CHANNEL.

William Mack, B. L. Pennington, John Mitchell, James Corrigan, C. H. Benham and M. A. Bradley of Cleveland and Mr. F. W. Wheeler of West Bay City were among a delegation who left Cleveland, Wednesday, for Washington, to secure, if possible, an appropriation of $25,000 for widening the channel at "Collision Bend," St. Mary's river. The delegation will be joined at Washington by Secretary Keep, and will be prepared with reports of accidents at this point in the St. Mary's river to show that there is absolute need of the channel being dredged. It was expected that the amount needed for the work would be taken from the 20-foot channel appropriation while the civil sundry appropriation bill was being considered in the House, but Congressman Blanchard did not introduce the required amendment, as he thought it would endanger the passage of important contract river and harbor appropriations. The effort now will be to secure the amendment in the Senate and have it agreed to in conference.

TRYING TO CUT DOWN APPROPRIATIONS.

Both houses of congress have now passed the omnibus lighthouse bill authorizing practically all of the aids to navigation sought by lake vessel owners during the past three years. It is doubtful, however, whether any appropriations can be secured for these lights, fog-signals, etc., in the civil sundry appropriation bill, which has passed the House and is now before the Senate, as the finance committee of the Senate, strangely enough, proposes to even cut down the House appropriations for such river and harbor works as the St. Mary's Falls canal, Hay lake channel and 20-foot channel.

Steam Towing Machine.

The American Ship Windlass Company of Providence, R. I., has just completed a steam towing machine for the world's fair, which will prove as effective in towing vessels as the steam windlasses and steam capstans manufactured by this company have proved in handling anchors, chains and hawsers. Only twenty-five years ago the American Ship Windlass Company was recommending its steam windlasses to the public, but it is not until within the last ten years that they have come into general use, and it is only within the last five or six years that the steam capstans have come into general use. There is no question but what the steam towing machine will be as great a success and will be as generally used by steam tugs and steamships for towing as the steam windlasses and steam capstans are now used for handling anchors and chains and for handling large hawsers. One wide awake concern at Cleveland, O., has ordered one of these steam towing machines, which is nearly completed. The American Ship Windlass Company is also building a steam windlass with several new features for its exhibit at the fair, and an improved yacht windlass will also be placed on exhibition. These machines will all be for sale, to be delivered at the close of the fair.

Stocks of Grain.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Feb. 11, 1893:

	Wheat, bu.	Corn, bu.
Chicago	14,322,000	6,443,000
Duluth	15,867,000	331,000
Milwaukee	2,201,000	19,000
Detroit	1,946,000	18,000
Toledo	3,646,000	1,518,000
Buffalo	3,052,000	85,000
Total	41,034,000	8,414,000

Leakage From Frost.

Severe frost will cause a greater shrinkage in oak timber than any kiln-drying process. Several of the boats in which bad leaks were developed at Chicago during the recent cold snap, causing some serious losses to grain cargoes, were counted among the driest vessels on the lakes. In some of these vessels the oakum could be picked from the seams in large quantities with a pen-knife. The worst losses occurred with vessels that were several times loaded and unloaded in transferring grain from Armour's irregular elevator to a regular house near by.

"A Cruise in a Dictionary."

We have a few copies of this little book and readers of the REVIEW can have them. It is issued by the North German Lloyd Steamship Company by arrangement with the publishers of the Century Dictionary, and it contains the record of an evening's search through the dictionary in pursuit of information as to nautical terms. It is a most unique advertisement. Send a 2-cent stamp to cover postage.

Figures Having a Bearing upon Freights.

The capacity of new freight vessels added to the lake fleet in 1892 was 90,576 gross tons, and the capacity of vessels now under contract, all to be completed by June 1 next at the latest, is 87,670 gross tons, or a total of 178,246 gross tons for the two years. The capacity of freight tonnage lost during the season of 1892 was 28,708 gross tons. These figures are given by request. This new tonnage will, of course, have some bearing upon the question of freights.

In General.

No less than thirty-five twin screw vessels of 5,000 tons or over are now running or building in different parts of the world.

An advertisement elsewhere in this issue offers for sale the lumber steamer Belle Cross and three barges. They must be sold together.

Engineer-in-Chief Melville and Chief Constructor T. D. Wilson of the United States navy have been elected honorary members of the Institute of Naval Architects of England, a society in which the honorary membership is limited to five.

We are in receipt of a pamphlet which treats at great length, and in an interesting way, of the Ward coil boiler as fitted to the United States coast defense vessel Monterey, recently completed at San Francisco. A copy of it can probably be secured by addressing Ward's Steam Generator Works, Charleston, W. Va.

A bill has been introduced in the New York state legislature giving Sherman Petrie of Brooklyn, N. Y., permission to experiment on the state property along the Erie canal, under the supervision of the superintendent of the public works, with the trolly system of propelling canal boats.

At the Cramps shipyard, Philadelphia, work will begin next month on the Brooklyn and Iowa, new naval vessels for which contracts have just been let. These vessels will be laid down in the same places now occupied by the battleships Indiana and Massachusetts, both of which will be launched during March—the former about March 1.

The new machine shop which the Berlin Iron Bridge Company of Berlin, Conn., is to build for S. F. Hodge & Co. of Detroit, will be 150 feet long, and of the modern type, the central portion being 40 feet in width, controlled by a traveling crane of 20 tons capacity, with a wing on each side 22 feet in width, the wings being two stories high.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company	$100 00	$ 51 00	$.....
Champion Iron Company	25 00	.....	35 00
Chandler Iron Company	25 00	40 00	41 00
Jackson Iron Company	25 00	.....	82 50
Lake Superior Iron Company	25 00	26 00	.....
Minnesota Iron Company	100 00	65 00	66 00
Pittsburgh & Lake Angeline Iron Co.	25 00	.....	135 00
Republic Iron Company	25 00	.....	10 25
Ashland	25 00	.....	.....
Section Thirty-three	25 00	.....	.....
Brotherton	25 00	.....	.....
Iron Belt	25 00	.....	2 00
Aurora	25 00	8 00	9 00

Cleveland stockholders of the Blue Mining Company are informed that the ore body for which shaft sinking has been going on for some time past has been struck. This property, which adjoins the Schlesinger syndicate's Buffalo mine, is controlled by Samuel Mitchell of Negaunee and William Chisholm and W. D. Rees of Cleveland. The stock is in a few hands and development work has been under the direct supervision of Mr. Mitchell. Another mine controlled by Messrs. Mitchell and Chisholm, Section Thirty-three of the Gogebic range, is not, however, turning out very favorably, as shown by a circular, sent out from the office of the company in Negaunee and just received by stockholders. The circular says: "In consequence of the low price ruling for ores last season, which is likely to continue this year, and probably in the future, and inasmuch as the upper lenses of ore are worked out, necessitating the sinking of our shafts to considerable depths, which is expensive, and when these shafts are put down if we should reach the ore, we would take all the water from the adjoining mines on the west, which would make mining expensive, so that to pump all the water, pay the necessary organization expenses, such as superintendents, mining captain, etc., against only a moderate possible output, we are not encouraged in making further expenditures of large amounts, and as Mr. Chisholm, Capt. Mitchell and associates have an opportunity to dispose of 14,900 shares of the capital stock of our company at $1 per share for the lease and materials of all kinds now on the ground at the mine, (the ore mined having been shipped) we have concluded it is to our interest under all the existing circumstances to accept same, and can sell to same parties your stock at the same price, ($1 per share) if you let us hear from you at once, by sending your stock certificate properly endorsed and witnessed, and we will remit you for the same at the rate of $1 per share as stated above. The other assets of the company will be divided as soon as collections can be made, etc., being about $2.50 to $3 per share, which will be in addition to the selling price of $1 per share. We have sunk two of our shafts about 300 feet each since the lenses of ore gave out, and we do not know how much further the shafts may have to go to reach another lense of ore and cannot see any encouragement to continue work at present outlook, and prefer to divide what money we have rather than spend it sinking in rock and fighting a large flow of water at present depth of 620 feet." This is not very encouraging news to stockholders. The sale of the property on the basis outlined in the circular is, of course, certain, as there is but 20,000 shares of the stock in all. Following the payment of a dividend by the company some time ago, the stock sold as high as $20 a share.

Although strong opposition has been encountered by the Minnesota legislators who propose to place a tonnage tax on the output of the mines of the state, there is still some fear of a bill of this kind being passed. Such a measure would certainly retard development of the new iron ranges of Minnesota.

At the annual meeting of the Standard Ore Company, one of the leading Mesaba corporations, in Duluth last week the old officers were re-elected as follows: Stevenson Burke, president; H. P. Barbour, vice-president; George V. I. Brown, secretary and treasurer; F. A. Bates, general manager. Directors are: H. W. Oliver, Pittsburg; Stevenson Burke, Price McKinley, Cleveland; A. D. Thomson, H. P. Barbour, P. M. Graff, F. A. Bates, Duluth.

Menominee and Gogebic range mining superintendents met at Iron Mountain, Mich., recently and decided to form a Lake Superior branch of the national association of mining engineers. It is expected to hold monthly meetings. William Kelly of the Penn Iron Company, Vulcan, is temporary secretary.

Managers of both the Lake Angeline and Cleveland mines are preparing to adopt the electric system of underground haulage. They are convinced that motors and other appliances manufactured by some of the leading electrical equipment companies are entirely practicable.

In referring recently to the regular dividend from the Chandler, which is expected on March 1, an error of the types caused the amount per share to appear as $2 instead of $1. The mistake was, of course, evident to stockholders of the company.

Around the Lakes.

Superior Dock and Dredging Company is the name of a new corporation, which is said to have the backing of the E. P. Allis Company of Milwaukee, and which, it is claimed, will construct new docks and warehouses at the head of the lakes.

As a result of a recent decision from the United States Supreme Court to the effect that a municipality can not demand a license fee from harbor tugs, Chicago tug owners have taken steps to recover money paid to the city under an ordinance taxing the tugs.

If the stage of water in the Cuyahoga river, Cleveland, is sufficient to warrant it, the new steel monitor being built by the Cleveland Ship Building Company for the Wilson Transit Company of Cleveland, will be launched Saturday afternoon. This boat will be named Yuba and will be commanded by Capt. Carlisle, last season in the steamer Yakima.

Capt. John S. McNeill, who last season commanded the steamer City of Paris and will be in the city of Venice during the coming season, has been engaged by the Inland Lloyds to inspect wooden vessels at Chicago. Vessels wintering at the different ports along the west shore of Lake Michigan and Green Bay will again be inspected by Capt. C. K. Moore.

Officers selected for the Eddy-Shaw fleet of Bay City are as follows: Steamers—Selwyn Eddy, Captain, Harry Zealand, Chief Engineer, William Blacke; E. C. Pope, Captain, Howard L. Shaw, Chief Engineer, R. Hill; Charles A. Eddy, Captain, J. Jenkins, Chief Engineer, George Wilson. Schooner Newell A. Eddy; Captain, W. H. Burton.

The Toledo, Ann Arbor & Northern Michigan Railway, H. W. Ashley general manager, offers for sale the steamer City of Marquette, tug J. H. Doan and a sand sucker. All three of the boats are at Frankfort, Mich. The City of Marquette is a passenger steamer of 341 gross tons, allowed seventy regular and 180 excursion passengers. The tug Doan, eleven years old, is 41 feet over all, has an engine 14x14 and a horzontal boiler 9 feet long and 54 inches shell, allowed 110 pounds of steam. The sand sucker was built only a few months ago.

Temperature at the Sault during January averaged 6 degrees above zero. This is the lowest average for several years. In 1889 the average for January was 20 degrees above, and the mean temperature for the month of January during five years past has been 14 above. The lowest temperature ever recorded at the Sault was on the 10th of last month, when the thermometer indicated 26 degrees below. This certainly means heavy ice, but whether it will be late in breaking up remains to be seen.

One section of the Harter bill, which has just become a law, is of importance to lake vessel owners. It is the third section which provides "that if the owner of any vessel transporting merchandise or property to or from any port of the United States of America shall exercise due diligence to make the said vessel in all respects seaworthy and properly manned, equipped and supplied, neither the vessel, her owner or owners, or charterers shall become or be held respousible for damage or loss resulting from faults or errors in navigation, or in the management of said vessel."

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Chicago Office, Western Union Building, 110 LaSalle Street.
Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,600 vessels, measuring 1,154,870.38 tons in the lake trade. In classification of this fleet the lakes have more steamboats of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of vessels of 1,000 to 2,500 tons on the lakes on June 30, 1891, was 310 and their aggregate gross tonnage 512,787.58; in all other parts of the country the number of this class of vessels was, on the same date, 213 and their gross tonnage 319,750.84. The classification of the entire lake fleet is as follows:

Class.	Number.	Tonnage.
Steam vessels	1,592	756,751.53
Sailing vessels	1,243	325,131.06
Canal boats	703	72,515 42
Barges	62	20,472.37
Total	3,600	1,154,870.38

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	No. of boats.	Net Tonnage.
1887	152	56,488.32
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
Total	1,021	485,042.94

St. Mary's Falls and Suez canal traffic: Number of boats through St. Mary's Falls canal in 1890, 228 days of navigation, 10,557; tonnage, net registered, 8,454,435. Number of boats through Suez canal during 1890, full year, 3,389; tonnage, net registered, 6,890,014. Number of boats through St. Mary's Falls canal in 1891, 225 days of navigation, 10,191; tonnage, net registered, 8,400,685. Number of boats through Suez canal during 1891, full year, 4,207; tonnage, net registered, 8,698,777. Number of boats through St. Mary's Falls canal in 1892, 233 days of navigation, 12,580; tonnage, net registered, 10,647,203. Number of boats through Suez canal during 1892, full year, 3,559; tonnage, net registered, 7,712,028.

Entered at Cleveland Post Office as Second-class Mail Matter.

MANY warm friends of American shipping will not agree with William W. Bates, ex-commissioner of navigation, in his ideas of subsidies and the absolute need of this kind of protection in securing an active commerce, but there is one feature of the book which he has just issued, "American Marine, the Shipping Question in History and Politics," that will meet with almost unanimous approval from marine interests. He makes a strong plea for a department of commerce. Such a department, the author claims, would represent in its work not only the national but the individual interests. It would do for the mercantile, the mechanical, the nautical and other interests connected with ships what the department of agriculture does for the businets of tilling the soil, in originating and promoting advantageous measures and removing obstacles to success. A department of commerce, with a cabinet secretary in charge, selected for business ability, with authority to investigate all matters relating to trade and transportation, collect information and block out measures for the consideration of congress, could do more good in a decade for shipping, than will ever be done in a century with marine matters neglected as at present by the treasury department. As proof of the claim that the treasury department does not even administer the present laws relative to commerce and navigation, Capt. Bates goes over the reports and records of secretaries from Alexander Hamilton to Charles Foster, who, he says, "has manifested no interest in the cause of the American ship." He finds that out of thirty-two secretaries of the treasury who have made one or more reports to congress, less than twenty have said anything about navigation as an interest. "Only three of them," he says, "advocated fostering legislation, and but one perceived, with any degree of clearness, the true causes of our shipping decline. This officer was Secretary Windom." The shot aimed particularly at Secretary Foster, who removed Mr. Bates from the treasury department, is characteristic of the ex-commissioner. Unnecessary allusion to the department as a "mere tax gathering and distributing machine," also tends to weaken the author's argument against the control of maritime matters in the treasury branch of the government. Otherwise the claims for a department of commerce are all right.

A WORD to owners of steel vessels: If you want to insure your property at Lloyd's of London in future, as many have done in the past, get posted on the standing of the different classification societies among British underwriters. Representatives of Lloyd's Register now engaged in investigating the whole question of lake shipping say that there are only two classification societies in the world whose ratings are generally accepted by English insurers. It is hardly probable that surveyors for Lloyd's Register will begin operations on the lakes in time to have any effect on the foreign insurance business for the coming season, and risks will probably be taken by the English underwriters as in the past, but this question of classification will without doubt be of the greatest importance in the future.

REPRESENTATIVES of the lake shipping interests in Detroit, Buffalo, Cleveland and other places on the lakes have been considering the advisability of urging the appointment of Harvey D. Goulder of Cleveland to the judgeship to be made vacant in the United States circuit court by the advancement of Judge Jackson to the supreme court. Although Mr. Goulder has an admiralty practice that is certainly equal to that of any attorney in the country engaged in the same line, it is thought that he would accept the circuit judgeship. He is eminently fitted for the place, especially on account of the large number of admiralty cases that are constantly being heard in the circuit to be vacated by Judge Jackson.

A CONTRACT will soon be let by the light-house board for patrol service on St. Mary's river. P. M. Church, who has been in charge of the buoys for two seasons, has done his work faithfully and to the entire satisfaction of the shipping interests. The temptation is strong for low bids on this work, if there is an open letting of the contract. A low bid means poor service, however, and the government officers should bear this in mind, This contract should not be awarded to irresponsible parties.

The New Lake Light-Ships.

Although no contracts have been let as yet for the new lake light-ships, on the plans of which the light-house board has been at work for some time past, it is announced in the annual report that they will be in readiness for the opening of navigation in 1893. The board was authorized by an item in the sundry civil appropriation act approved August 5, 1892, to use the $60,000 appropriated on August 30, 1890, to build a light-house on Eleven-Foot-Shoal, for establishing one or more light-ships on the lakes. An appropriation of $25,000 was also made in the act of August 5, 1892, for establishing a light-vessel at Bar point, Lake Erie.

"It is now expected" says the report "that five light-vessels can be provided from these appropriations. Plans for them are now being made. Four of them are to be made of wood, to be about 80 feet long, with 20 feet beam, and are to draw not more than 8 feet of water. They are to have steam fog signals, but are not to have self-propelling power. The ship for Bar point is to be built on similar lines, but will be larger. It is not expected that such lightly built vessels can last nearly as well or as long as those built according to the board's standard. But it is expected that they can be kept in commission until congress has opportunity to determine whether they are to be replaced with light-houses, which would be more economical in the long run, or whether they are to be replaced by light-vessels of a permanent character. It will cost $4,000 a year to maintain each of these vessels."

Senator Hill Favors a New Canal Programme.

A correspondent writing the Philadelphia *Press* from New York, regarding a recent visit made by Senator Hill to Albany, says:

"Senator Hill has some purposes now which are not political. He is looking for business legislation which is creditable. For some years the senator has thought that if New York is to maintain its commercial prestige it must practically rebuild the Erie canal, provide for vessels of a draught of from 9 to 12 feet, and possibly erect an electric plant along the banks as a substitute for horse power for canal boats and barges. Governor Flower has recently expressed himself as in favor of such use of electicity, and the suggestion has been made that possibly when the Niagara water power has been developed, and especially that plant which is on the Canadian side of the river, a sufficient current may be procured to give all the power needed.

"Senator Hill does not think that the state of New York should pay the expenses entailed by this great work. Because such a canal would furnish competition with the artificial waterways of Canada, the senator believes that the United States government should, with the co-operation of New York, build this new canal. He is likely to urge at an early day this matter upon the attention of congress. He seems of late to have been quite as concerned over the project as he has over any of the political movements of the day, in fact, appearing to be entirely indifferent to the gossip which prevails respecting Cleveland's cabinet.

"Some of the senator's friends say that he is also interested in the proposition to cut a canal with depth of 10 or 12 feet across the lower peninsula of Michigan. That is a project in which Col. Frank Bond has been interested. Col. Bond is one of the abler of the railway managers of this country, and, notwithstanding the ability he has shown in his railway work, impresses those with whom he has talked with the enthusiasm and certainly the plausible reasons which he advances for the construction of a waterway which would be a competitor for railway traffic. Col. Bond and Senator Hill believe that with a ship canal cut from the eastern shore of Lake Michigan to the western extremity of Lake Erie, and another which will be only an enlargement of the Erie canal, the commercial supremacy of both Chicago and New York would be maintained for another hundred years, while the advantage to commerce would be enormous and the restraint which such an artificial waterway would place upon railway management would be of incalculable benefit to the people. The senator goes even further, believing that ultimately a ship canal, in every way worthy of the United States government, will extend from Chicago to the Mississippi river. Some of Senator Hill's friends think that he proposes early in Cleveland's administration to take the initiative in congress for legislation to secure the construction of these colossal waterways.

"I hear that the legislature of New York is entirely disposed to pass such laws as may seem necessary, provided the co-operation of the United States government may be secured. The state will not alone undertake this work, although the senator's opinion is that it would not cost so much to enlarge the canal as it did originally to build it. It is possible that Senator Hill, having the great prestige of DeWitt Clinton in mind, may be tempted by the hope that some personal glory would come to him if he should be identified with this work."

The Siren as a fog Signal.

Undoubtedly the siren is one of the best fog signals. Its penetrating though exceedingly disagreeable note can be heard farther than any other sound, except perhaps an explosion, and it can be given any desired characteristic. Yet of the 255 fog signals of various kinds in the United States, not including whistling and bell buoys, but eighteen sirens are now in use. The reason is the expense. There is but one firm in the world that makes them, so this firm has the monopoly and charges accordingly. It is justified in so doing, however, as it spent a great deal of money in perfecting this instrument.

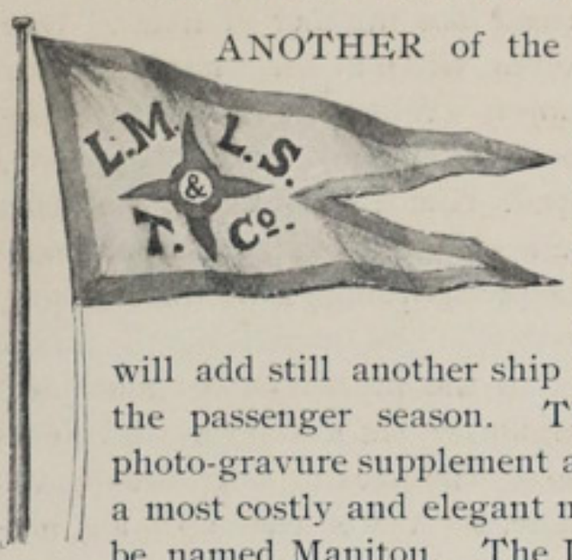
A siren is a simple enough instrument. It consists of two superposed disks, with a certain and like number of holes. One disk is stationery, the other revolves, while at the same time air or steam is forced through the holes. When the holes are opposite each other, the steam will pass; when they are not opposite, the passage of the steam is stopped. Hence when one of the disks revolves the steam passes in a series of puffs. If these puffs succeed each other with sufficient frequency a note is produced rising in pitch with the rapidity of revolution and increasing in power with the pressure of the steam. In the present siren the disks are revolved by a small steam engine, which also opens and closes a valve to allow for the passage of the steam, and thus gives what is known as the characteristic, for a siren used as a fog signal does not sound continuously, but gives a certain number of blasts of a definite length per minute. The steam is supplied by a boiler both for the engine and the siren, and, to avoid possible breakdowns, the boilers, engines and sirens are always in duplicate. The steam pressure is ordinarily about 50 pounds, and the sound can be heard from ten to fifteen miles, and occasionally much farther, depending on the weather.

The same firm which makes the sirens makes also a very much cheaper and nearly as effective an instrument known as the "self-acting siren," which requires no engine and which is much used on the transatlantic steamers in place of steam whistles. The steam itself revolves the disks, and the blasts are given by simply opening the valve by hand. The speed of revolution of the disks is automatically regulated by an ingenious centrifugal brake. A self-acting siren would make an admirable fog signal if it could be given a characteristic automatically. This is accomplished by the use of "Crosby signal," a clockwork device, which can be set to automatically open the steam valve any defi- number of times per minute, the clock being also wound up automatically each time the siren is blown. One of these fog signals has lately been installed at Execution Rocks light-station, Long Island Sound. It consists of two locomotive boilers with their accessories, two self-acting sirens, and two Crosby signals, so arranged that either boiler and either Crosby signal can actuate either siren. The sound has been heard a distance varying from eight to seventeen miles. The cost of a first-order siren in duplicate, without boilers, is $4,800. The cost of the self-acting siren and Crosby signal in duplicate, without boilers, is $925. The Crosby signals are manufactured by the government, the light-house board having bought the patent.

Keeping an Account of Iron Matters.

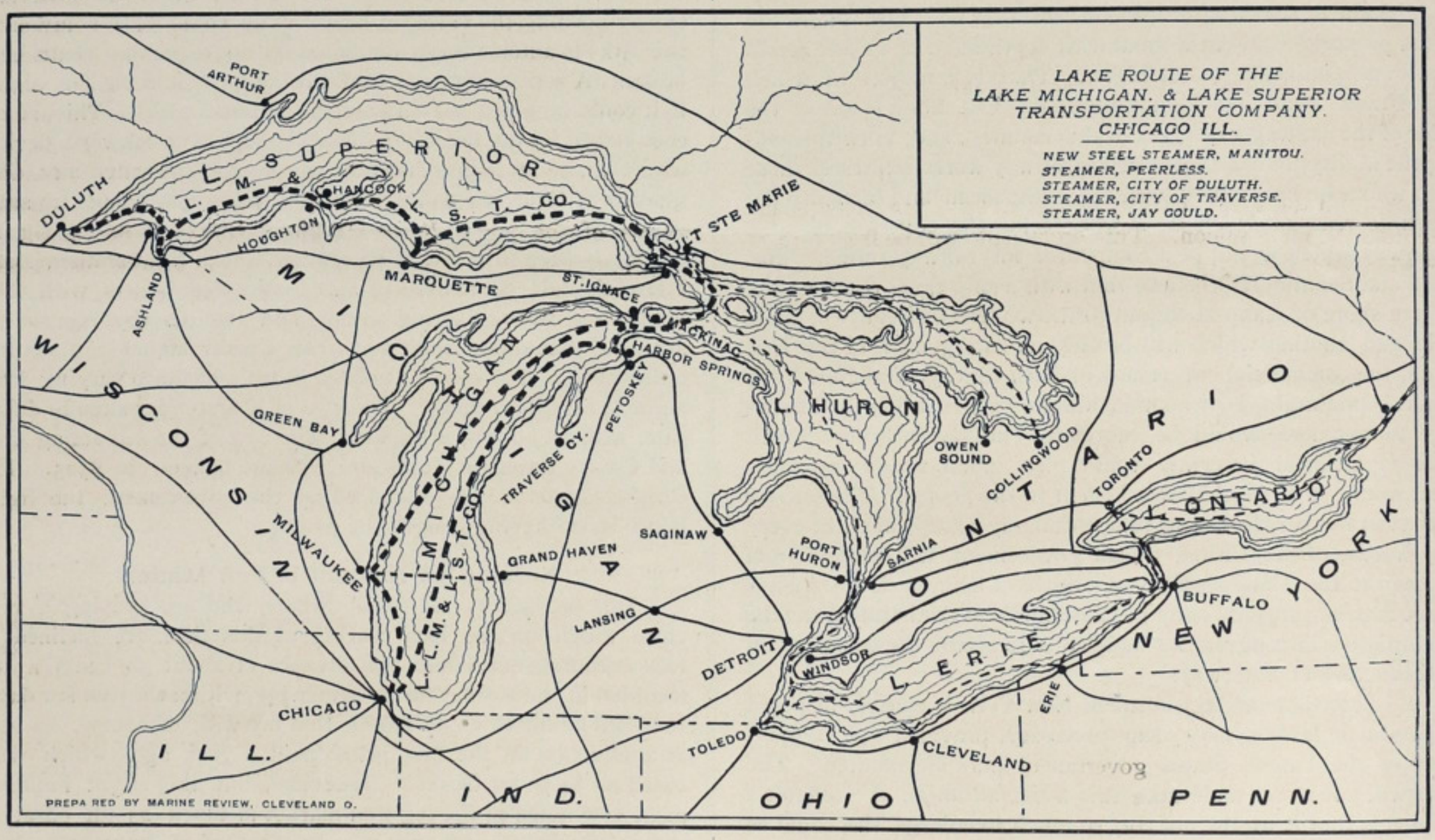
Iron ore dealers and vessel owners, who are keeping a very close watch on the iron market at this time, are inclined to take encouragement from the advance of about 50 cents a ton recorded in the market for Bessemer pig, within the past few days. It is still admitted on all hands, that ore will, of course, be sold at a reduction on the first prices paid a year ago, which were based on $4.50 for Gogebic Bessemers, but the slight improvement now noted in the pig iron market is taken as an offset to claims of some furnace men who have talked of $3.75 as a price for good ores. An ore dealer, who is also a large owner of vessel property, sums the situation up in this way: "It is true," he says, "that everything in the way of iron and steel, excepting steel rails, which are controlled by a combination, is lower than at any time in the history of the country, and everybody in the business has grown tired of hearing it said that bottom prices have been reached, especially in pig iron. Now we are told that the advance in pig at Pittsburg is due to a few furnaces being out of blast, but slabs are higher also, and most ore sales agents, knowing that there will be a demand for a very heavy output during the coming season, no matter what the prices may be, are willing to trust to the belief that the turning point in the market for pig iron has been reached; they must pay lake freights about equal to those of last year in order to make contracts for transportation throughout the season, and cannot ignore this important factor in sales."

STEAMSHIP MANITOU—LAKE MICHIGAN AND LAKE SUPERIOR TRANSPORTATION COMPANY.



ANOTHER of the transportation companies, the Lake Michigan and Lake Superior Company, of Chicago, which has been operating passenger and freight steamers on Lakes Michigan and Superior for a great number of years past, will add still another ship to its fleet upon the opening of the passenger season. The steamer, as shown in the photo-gravure supplement accompanying this issue, will be a most costly and elegant modern passenger ship, and will be named Manitou. The Lake Michigan and Lake Superior Transportation Company is probably the oldest concern on the lakes maintaining an independent line of passenger and freight steamers, aud under the undivided and strict attention that has been given to its passenger business, it has grown to such large proportions that, in order to accommodate its increasing patronage during the tourist season, (which usually comprises the months of July and August and parts of the months of June and September,) another boat specially fitted to this service has been planned with a great deal of care.

The new steamship, now building by the Chicago Ship Building Company, is the result of plans that were under discussion



these requirements in construction are fully complied with, as the Veritas rating which they seek is especially valuable in a passenger boat. Not only is this rating valuable from an insurance standpoint, but also from the fact that it gives to the patrons of the company assurance that the owners have complied with every demand necessary to securing for their ship a certificate from one of the leading classification societies of the world, guaranteeing the best construction for the trade in which she is to be engaged.

The ship has an over all length of 295 feet, keel 275 feet, beam 42 feet and depth to spar deck of 24½ feet, or to hurricane deck 32½ feet. The water bottom is 3½ feet deep, extending the whole length of the vessel and divided into eight compartments, while seven water tight bulkheads in the hull afford a degree of subdivision and safety which has never as yet been introduced in vessels of her class. It is with special pleasure that we point to this new departure, as it brings the danger of sinking down to a minimum ; in fact it makes it almost an impossibility.

The machinery, being built by the Cleveland Ship Building Company, consists of a triple expansion engine with cylinders 23, 38, and 62 inches diameter and 36 inches stroke, and two steel gun-boat boilers, 11 feet diameter by 21 feet in length, placed in a separate compartment and connected to one oval smokestack, and carrying 160 pounds of steam. The ship is expected to make from 15 to 16 miles an hour easily under natural draught, and for forcing the speed at any time a novel arrangement of induced

many months, and will be one of the finest vessels ever seen on the lakes, presenting many novel and agreeable features for the comfort, convenience and safety of the traveling public. This ship is being built of steel throughout, to the rules of the Bureau Veritas of France, and under the immediate supervision of Captain F. D. Herriman, the chief inspector for the lakes of that well-known classification society, and her rating will be the highest. The steel used is rigidly inspected and tested both at the mill and at the shipyard.

Specifications under which the vessel is being built provide for materials that are more than equal to the standard, and Capt. Herriman says that if built according to the specifications the steamer will be given the highest rating to which lake vessels will be entitled in the records of the Bureau Veritas. There is no doubt, of course, that both owners and builders will see to it that

draught is being fitted, consisting of two Sturtevant exhaust fans placed in the base of the stack, through which, when in operation, the products of combustion will be drawn, thus increasing the draught and combustion of fuel and producing the same effect as increasing the heighth of the stack.

Connected air, bilge and cold water pumps, independent feed pumps and a feed water heater are other features in the machinery. There will be three 44-inch furnaces to each of the boilers, and one donkey boiler 4 feet diameter and 7 feet high. The pistons of the engines will be of cast steel, the same as is now generally used in the navy, and in this there will not only be a saving in weight of about 25 per cent. over cast iron, but there will be less vibration to the hull, which is an important advantage in a passenger ship.

In her interior appointments, furnishings, etc. no expense is to be spared ; in fact whatever human ingenuity can design is to

be made available. Passengers will enter the boat on the main deck aft of the engine, where a sliding plate glass door leads to a reception hall 24 by 26 feet, furnished with ample seating capacity. On one side of this hall is the steward's offices and on the other the office of the purser. All the facework in this reception hall is polished Mexican mahogany. A baggage room, parcel room, barber shop, wash room, etc. will be found forward and aft of the main hall, all of them commodious and easily accessible.

A broad mahogany stairway leads to the main saloon, a beautiful room furnished in gorgeous style, upwards of 200 feet in length, intercepted only by the machinery inclosures, flanked on each side by a double row of staterooms and lighted by domes over the hurricane deck-houses with galleries for access to the upper rooms. The finish is in mahogany below with plate glass in stateroom doors and white and gold above, with mahogany gallery railings and staircases, presenting an elegant and unique appearance. The dining saloon is placed forward on the spar deck, extending the full width of the ship, being 43 feet in length, lighted by large brass bound dead-lights at the sides and an oval dome overhead, and finished in red birch. The pantry is immediately forward of and adjoining it, and the galley, ice and storerooms, etc. on the main deck below. The cuisine on the ship will be made a special feature, such as has never been attempted by any lake steamship line. The culinary department will be presided over by chefs who are acknowledged to stand at the head in their line, and the dining-room service will be in accordance therewith.

Aft of the main saloon is a drawing-room, 20 by 22 feet, leading out on the spar deck. A feature of lake steamers prevailing ordinarily, that of having the promenade on the spar deck around the staterooms, will be entirely abandoned, in place of which the promenade will be located on the hurricane deck, reached from the spar deck aft, as well as by a convenient staircase from the main saloon. This promenade will be from 6 to 11 feet wide and about 275 feet long, fitted with seating capacity, and will be entirely under cover. The boats and life rafts are carried on steel bridges overhead. On the hurricane deck are located the ladies' parlor, 16 by 17 feet, and a gentlemen's smoking room, 15 by 17 feet, which are finished in oak with handsome skylights. The captain's office and sleeping apartment is also on this deck. The portion of the crew belonging to the engineer's department is accommodated on the main deck abreast of the engine room, and the remainder of the crew on the deck forward and on an orlop deck in the forward hold. The afterhold over the shaft alley is fitted up handsomely with berths for first-class passengers.

There are 120 staterooms for passengers, each fitted with marble washstands and running water, as well as electric lights to each stateroom. A number of the staterooms are of extra large size, finished in hardwood, with brass bedsteads instead of berths; two rooms will be fitted with lounges and pullman berths forming parlors during the day. Altogether about 400 passengers can be provided with first-class sleeping accommodations.

The electric lighting equipment, furnished by the Fisher Electric Company of Detroit, will include 650 lights, distributed throughout the cabins and staterooms, the incandescent lamps being supported in metallic husks. Current will be furnished by two direct connected twin compound engines and dynamos, and the boat will be divided into fourteen circuits. Automatic signal appliances will be employed, and it will be a perfect outfit in every particular.

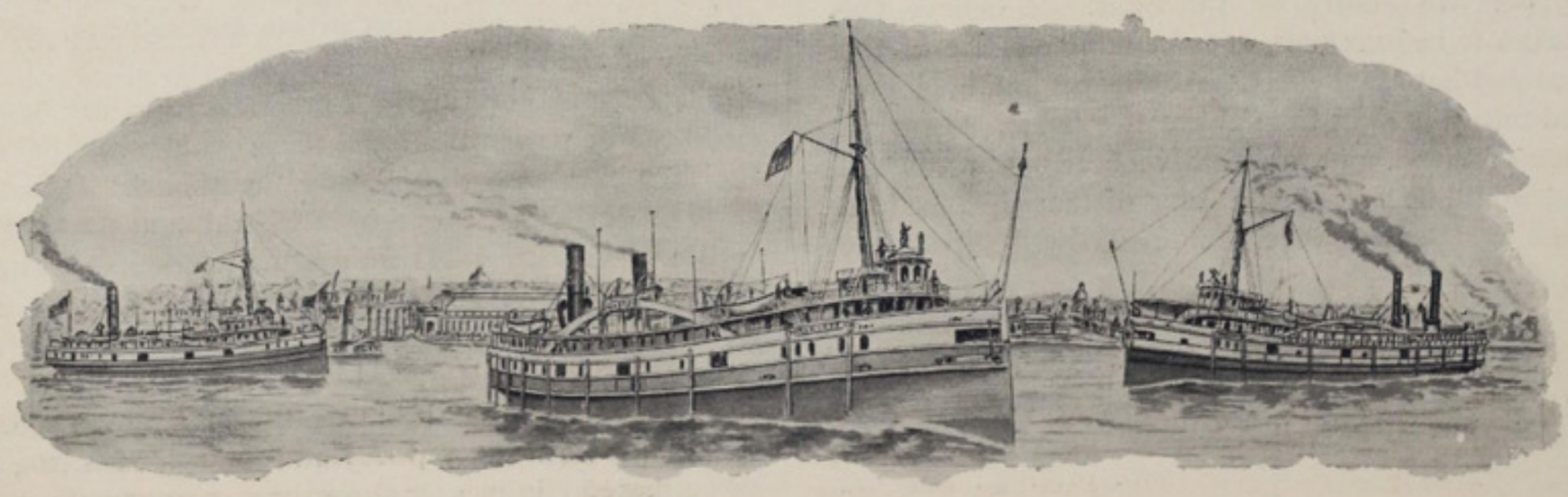
All of the usual modern improvements are, of course, fitted to the ship, including steam capstans and windlass, steam stearing gear, steam freight elevators, bridge telegraphs, automatic fog whistles, etc.

It is expected to have this steamship fully equipped and ready for service by about the middle of June next, and she will at once enter on her designed route between Chicago and Sault Ste. Marie, stopping at Mackinac island and Harbor Springs, and making two round trips each week. She will be commanded by Captain Allan McIntyre, so well and favorably known to the traveling public. The other steamers of this company's fleet are the City of Duluth, City of Traverse, Peerless and Jay Gould, which will make as in former seasons, semi-weekly trips between Chicago and Duluth, stopping at Milwaukee, Mackinac island, Sault Ste. Marie, Marquette, Hancock, Houghton, Ashland and Bayfield.

When this new boat is added to the present fleet, the company will have two distinct routes covering every point of interest on the two lakes. One route will be from Chicago to Milwaukee, thence to Mackinac island, up the St. Mary's river to Sault Ste. Marie, and from that point up the full length of Lake Superior to Duluth. The other route will be from Chicago to Harbor Springs on the east shore of Lake Michigan, thence to Mackinac island and to Sault Ste. Marie. On the Lake Superior route, the vessels stop at Marquette, one of the centers of the iron mining district, and at Hancock and Houghton in the copper region, affording opportunity also to visit all of the picturesque points and pleasure resorts of the lake. From Mackinac and Sault Ste. Marie to Detroit, Toledo, Cleveland, Buffalo and other eastern points, and from Sault Ste. Marie to the north shore of Lake Superior, as well as to Collingwood and Owen Sound, in the direction of the St. Lawrence resorts, there are direct connections.

It will be seen that the steamboats of this company with their connections cover the entire chain of lakes. In its own lines on Lakes Michigan and Superior, this company offers the greatest advantages for a summer holiday trip, however, as on these lakes, and at Sault Ste. Marie and the Straits of Mackinac, the most delightful summer resorts are found. Development of passenger business is certainly tending to make this tour of the upper lake the most popular summer trip of the American people. The trip from Chicago to Duluth and return, a distance of about 2,000 miles, can be made in about twelve days. From Mackinac, Sault Ste. Marie and other points reached from Lake Erie or from the East, a comfortable trip to Chicago or Milwaukee is afforded, and from these points also the time to the head of the lakes is shortened, while for tourists having ample time a most liberal system of stop-over arrangements is in vogue.

Officers of the Lake Michigan and Lake Superior Transportation Company are: Samuel F. Leopold, president; Albert T. Spencer, vice-president; Charles F. A. Spencer, secretary and treasurer; Joseph Austrian, general manager; Joseph Berolzheim, general passenger agent. General offices of the company are in Chicago at Rush and North Water streets.



New Method of Lighting the Statue of Liberty.

(By David Porter Heap, Major of Engineers, U. S. A.)

When the statue of "Liberty Enlightening the World" was erected on Bedloe's island, New York harbor, it was found that no provision had been made to show a light, except possibly through the windows forming the diadem. The statue consists of an iron skeleton covered with a copper skin and stands on a granite pedestal in the center of Fort Wood. In the daytime it is a most commanding figure, as it is of colossal size, the combined heighth of pedestal and statue being 305 feet. At night it would be invisible unless illuminated by artificial means. The very name of the statue almost imperatively demanded that it should exhibit a light, and as the right hand carries a torch from which flares an immense copper flame, the most natural thing to do was to make the flame luminous. Various methods were proposed; one was to place electric lights on the balcony surrounding the flame, which by reflectors, would throw their light on the flame, while the direct light would be screened from the eye of the observer. This might have answered fairly well had the flame been gilded, but one serious objection was that these outside lamps would be exposed to all weathers.

On Sept. 28, 1886, Lieut. John Millis, corps of engineers, United States army, was directed to report to Maj. Gen. J. M. Schofield, to assist in the preparation of a suitable plan. On Oct. 11, he submited a project, which, in brief, was as follows: I copy from his report "The plan proposed contemplates exhibiting a powerful electric light from the torch to be visible around the entire horizon, and such an arrangement of lamps and reflectors at the salients of the fort as to throw light directly on the statue and pedestal, besides the necessary illumination of the interior of the statue and pedestal and the engine and boiler rooms." In order that the light placed inside the torch should be seen, it was necessary to provide openings, so two rows of circular windows, like port lights of a vessel, were made in the copper flame. This plan was approved and was so promptly carried into effect that everything was in readiness for the inauguration ceremonies which took place on Nov. 1, 1886. Mr. Bartholdi visited the island on that night and expressed himself as entirely satisfied with the effect of the illumination. He appreciated the difficulty of making the statue itself visible by reflected light, owing to its dark color, and had certain ideas in addition, in regard to its illumination, as will appear from the following extract of a letter from him to the Hon. W. M. Evarts, dated Jan. 5, 1887:

"As regards the question of light, the subject of many controversies, the public has been somewhat surprised because the statue had been beforehand represented white and shining in the dark as if silvered, while such an effect is impossible, as the dark color of the copper will absorb all the light. I believe the determination taken to be excellent, and the luminous fire in the hand very logical and happy in effect. At the beginning a project had existed to throw light from above the flame, where an opening had been provided, and to direct vertically towards the skies a halo that would be perceived a long distance. The idea was also proposed to make the diadem luminous by lighting the inside of the head."

He also wrote Lieut. Millis on April 28, 1887, as follows: "The only effective lighting is to place a powerful light in the hand. I know that such a light seen from a distance will resemble any other light; that is, look like a powerful star, and the public might possibly desire something more original. Should you then wish to give such a feeling satisfaction in this respect, I think the head might be provided with a supplementary light, which shooting through the diadem openings would usually produce a very decorative radiance. Perhaps it might be a revolving light. A further idea would be to represent in the diadem openings, by means of stained glass, so well made in America, the national stars of the United States. This addition to the lighting would give a very original and peculiar aspect to the statue light. That in the hand, being very powerful, would be seen from afar, while the other in the head would be a decorative complement visible in the whole harbor. Such is the only suggestion I would allow myself to make, because the lighting of the statue by projection appears to me a useless expense unless some one would afford the luxury of plating the statue with gold or some shining metal." I was anxious that the method of lighting should be improved, and at the same time to carry out, as far as practicable, the ideas of the artist. I submitted my views to the light-house board; they were approved, and in consequence the following notice from the light-house board was issued on Sept. 30, last:

"Notice is hereby given that, on or about Oct. 21, 1892, the

following changes will be made in the lights and illumination of the statue of 'Liberty Enlightening the World', inside Fort Wood, Bedloe's island, New York bay, New York: In addition to the light now shown from the torch there will be a vertical beam of red and yellow light seen only by reflection from the haze or dust in the air. The face and bust of the statue will be illuminated by powerful search light from one of the salients of the fort. The coronet will be decorated with red, white, and blue incandescent electric lights. The pedestal will continue to be illuminated as heretofore, by arc lamps within the salients, and not visible outside of the fort."

The flame originally contained nine arc lamps of about 2,000 candle power each, and these could only be seen through the circular windows previously mentioned. Of course, a very large proportion of the light is wasted, and the observer can only see that which streams through the window opposite to which he happens to be. The nine lamps are now replaced with one self-focusing lamp of 5,000 candle power, and for the circular windows is substituted a glazed belt of plate glass 18 inches high. Inside the flame are mirrors made of aluminum reflecting a portion of the light horizontally and the rest of it in a vertical beam through a skylight, glazed with red, white, and yellow glass, the

different colors giving it somewhat the effect of a flame. The aluminum mirrors are corrugated, and the light reflected from their numerous faces seems to be of a diameter as large as the copper flame, and no longer looks like a bright point or star.

The making and fitting of the frame to hold the glass forming the glazed belt was the most troublesome and difficult part of the whole plan. It was done by first making templates of the flame where the upper and lower rings were to go on. These rings were then made in four pieces, and fastened securely outside the flame to the iron frame inside by means of bolts passing through the copper. After this was done brass sash-bars were screwed diagonally to the rings, the copper was then cut away between the rings, and the glass panes put in. These rings had to be irregular in shape and the work was altogether a cut-and-try job. The lighting of the coronet or diadem was considerably simpler. Fifty incandescent lamps of 50 candle power each are used and the globes surrounding them have the national colors. There are twelve red lights in the center, then six white ones on each side and thirteen blue ones over each temple. This effect is that of a crown of jewels composed of rubies, diamonds, and sapphires. The reason there are so few white lights compared to the colored ones is because there is so much loss of light due to the colored glass, and it was desired that all of the jewels should be equally well seen. A diadem with the face invisible would loose the greater part of its charm. Yet with all the lights in the salients of the fort throwing their beams on the statue, Liberty remained modestly out of sight at night. To partially overcome this a powerful search light has been placed in one of the salients of the fort, and throws its beam directly in her face. Now, every night, she may be seen with flaming torch, flashing diadem, and face illuminated, gazing forth over the noble waters of New York bay.

Electric Lights for Light-Ships.

In the annual report of the light-house board, just issued, there is a very interesting review of matters leading up to the use of electric lights for lightships. The report says on the subject:

"On Oct. 28, 1890, the naval secretary, Commander G. W. Coffin, United States Navy, addressed a letter to the light-house board on the subject of introducing flash and revolving characteristics into the light ships of the light house establishment and stated that there were at Staten island two English revolving-light apparatus for light-ships, which had been purchased by the board some years previously and had remained unused. The board was then designing a number of light-ships, and he suggested that that was an opportune time to consider the subject. He proposed that the new light-ship building for Sandy Hook be fitted with one of these revolving lanterns. He also suggested that the new light vessel for Cornfield point, Long Island sound, be fitted with a plant for electric flashing lights, and that the vessels building for Fenwick Island shoal and Martins industry be arranged to show the revolving light by a method of revolving shade before the lens.

"This subject was brought to the attention of the board at its meeting of Nov. 5, 1890, in the meantime it having been referred to the committee on floating aids. That committee reported that, in its opinion, every light, and especially every light-ship, should, as far as is practicable, have such characteristics that it shows, first, that it is a light-house establishment light and not a private light, and, second, that its characteristic should identify the light itself; and the committee recommended that the English revolving light then in store at the general depot be placed on the light-ship then building for Sandy Hook station, in form and manner as suggested by the naval secretary, and as soon as practicable. The committee also recommended that the light-ship for Cornfield point, Long Island sound, be fitted with electric flashing lights, in form and manner as suggested by the naval secretary, without undue delay. The recommendation with regard to the new light-ships for Fenwick island shoal and Martins Industry was also concurred in by the committee, and the committee finally recommended that the executive officers of the board be instructed to formulate a project for placing distinctive lights on all remaining light-ships in the service as soon as it was found practicable to do so, and that they be authorized to take all the necessary measures for this purpose. The report of the committee was acted on and approved on Nov. 5, 1890, by the board in session. It was ordered at the meeting that the chairman of the board be authorized to request any member of the board to consult and advise with the experts of the board at the general depot in reference to carrying into effect plans for using electric lights on light-ships.

"In accordance with this order the chairman directed Commander G. W. Coffin, United States navy, the naval secretary, Prof. T. C. Mendenhall, superintendent United States coast and geodetic survey, and a member of the light-house board, and Major David Porter Heap, corps of engineers, United States army, engineer of the third lighthouse district, to confer and formulate plans and specifications for this purpose.

As a result of this action, plans and specifications were prepared, and after full consideration advertisements were issued for competitive bids to furnish such a plant as the board had decided upon. The contract was awarded to the lowest bidders, and the plant was manufactured and delivered at the light-house depot at Staten island, where it was set up and put into effective operation under an agreement that when Cornfield point light-vessel, No. 51, had been delivered at the general depot, the contractors were to install the plant on board the vessel and guarantee its effective operation. Some time after the plant had been established at Staten island and tested from time to time, the Staten island company, which furnishes the electric current for lighting the depot, was so unfortunate as to have its buildings burned. The light-ship plant was then put in operation, and, although such a test was unexpected, lighted the depot successfully for two months, and until the electric company replaced their works and furnished the usual electric light.

"Cornfield point light-ship, No. 51, was delivered at Staten island in July, 1892, and accepted. As soon as possible thereafter the contractors installed the light-ship electric plant on that vessel, and upon the completion of their work the plant was operated for forty-eight consecutive hours and answered the requirements fully. This light ship plant consists of four lens lanterns hung on gimbals in brackets permanently fastened to each masthead. There is a gallery on the mast at the proper distance below the lanterns for the convenience of the men who clean the lanterns. In each lantern is a 100-candle-power incandescent light. It is estimated that with the increased power due to the lenses of the lens lanterns, the four lanterns at each masthead will give a total light equal to 4,000-candle power. Major Heap devised an exceedingly simple apparatus by means of which the lamps are extinguished and lighted automatically at definite intervals. Thus the light will have the appearance of a flashing light, and it will only be necessary to light one mast at a time to distinguish the light-vessel from other vessels. Both masts are, however, fitted with lens lanterns, and the boilers, engines and dynamos are in duplicate, and are so arranged that either boiler may be used with either engine, either engine with either dynamo, and either dynamo can light either mast. Should the electric system break down in spite of all these precautions, the lanterns contain oil lamps which can be lighted in a few moments. But the lights will no longer be flashing, nor will they be so bright, but with so many precautions it is hardly possible that it will be necessary at any time to use the oil lights. The electric plant also lights up the cabin and other parts of the vessel with electricity, 16-candle-power lamps being used. Major Heap has been indefatigable in watching the details, suggesting changes, and carrying into effective operation all the designs of the board, and the result shows the efficient manner in which he has performed these duties. The vessel is now being fitted out for her station and will shortly be placed thereon."

Handsome Triple Expansion Yacht Engine.

The illustration on this page shows the style of triple expansion yacht engines built by the Coller Steam Yacht and Engine Works, Detroit, Mich. A 160 horse-power engine of this kind drives a boat 50 feet long 20 miles an hour. For particulars, size of cylinders, etc., write the Coller company, Detroit, Mich.

Work is well advanced on the new boat building at the Simpson ship yard, Owen Sound, Ont., for the North Shore Navigation Company. This will be one of the best passenger ships to be turned out by Canadian builders this spring. Her engines, designed by Messrs. Logan and Ranking and to be built by Inglis & Sons of Toronto, will be triple expansion, with cylinders 18, 50 and 48 inches diameter by 30-inch stroke of piston. She will have three boilers of Scotch type, 11 feet 6 inches diameter and 9 feet 1 inch long, with six furnaces. The boilers will be allowed 165 pounds of steam to the square inch, and it is expected that the boat will make 15 miles an hour.

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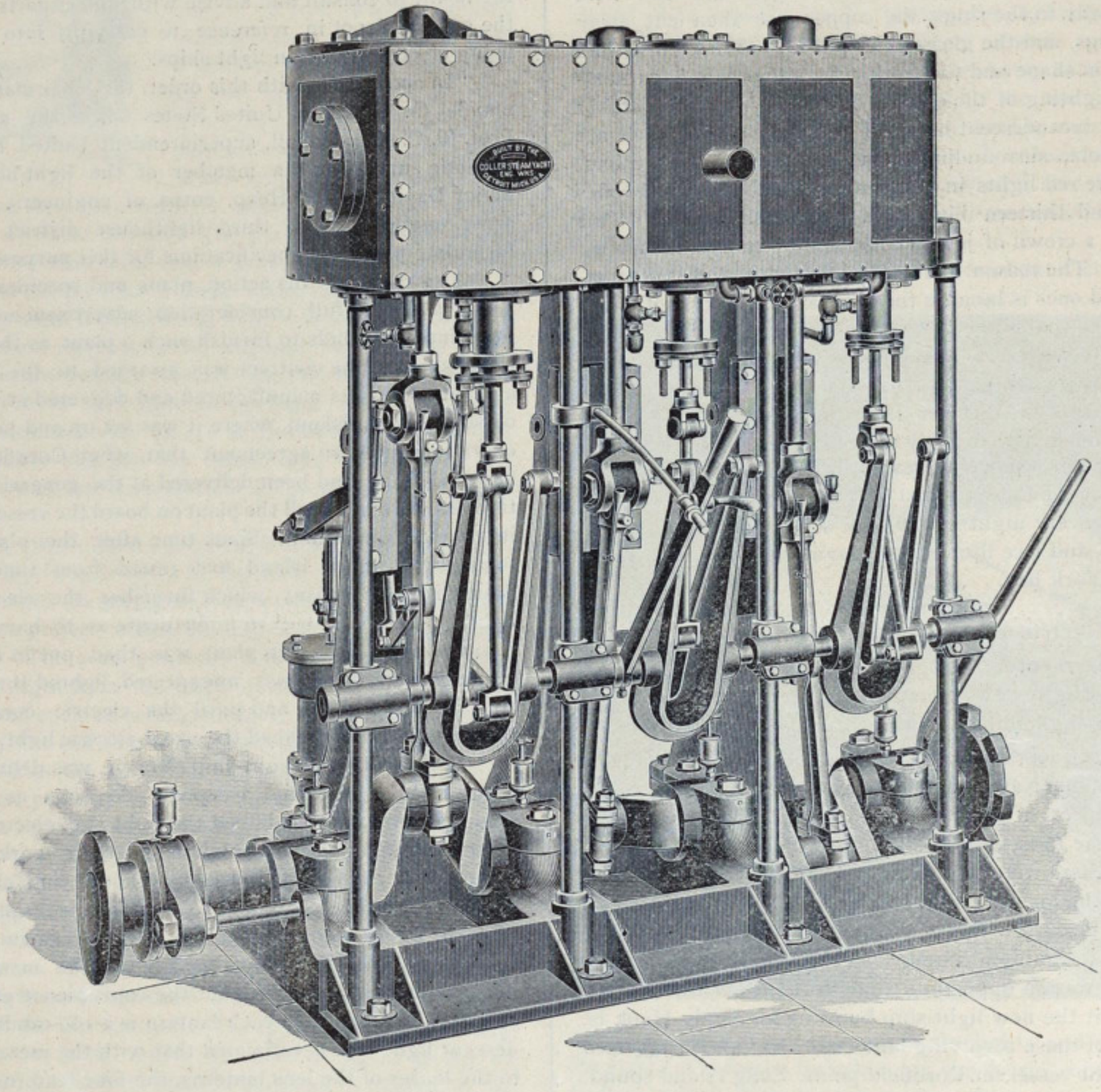

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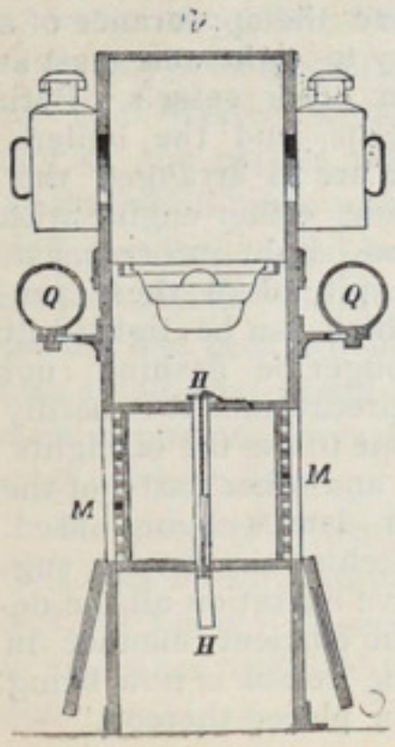

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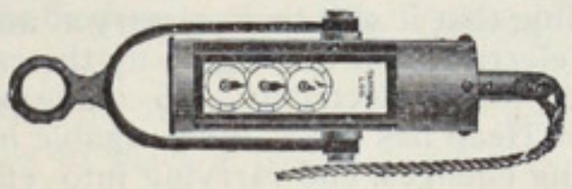

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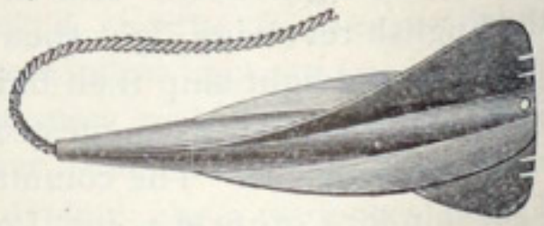

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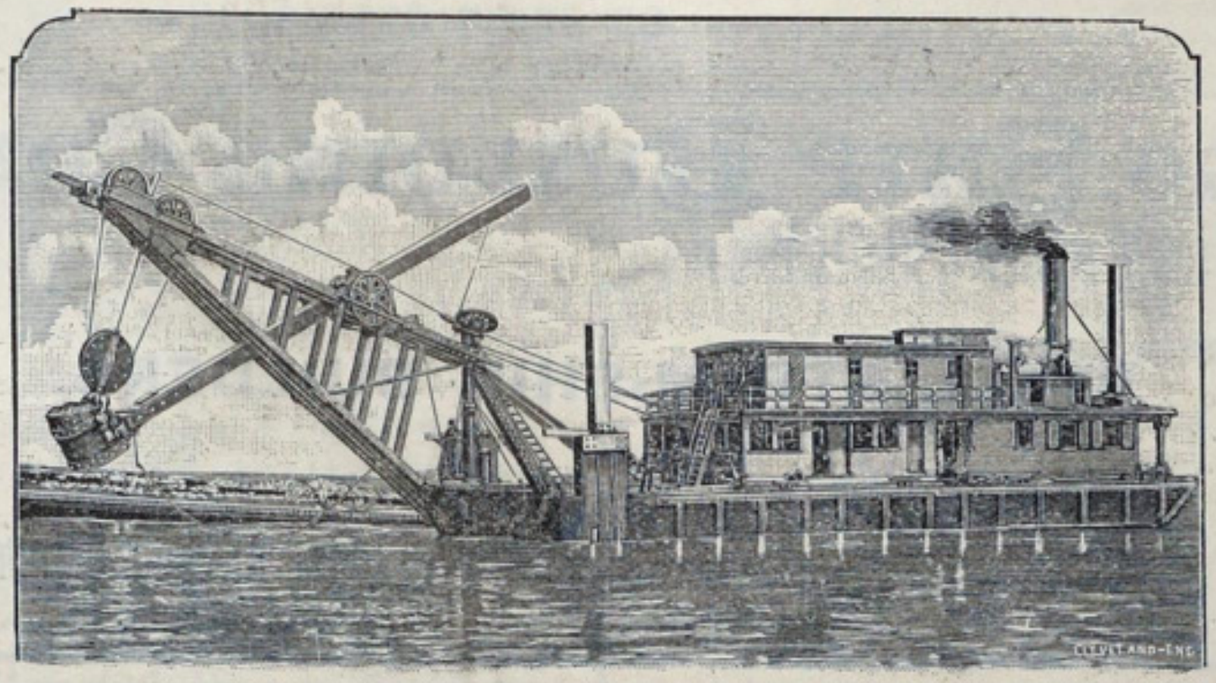

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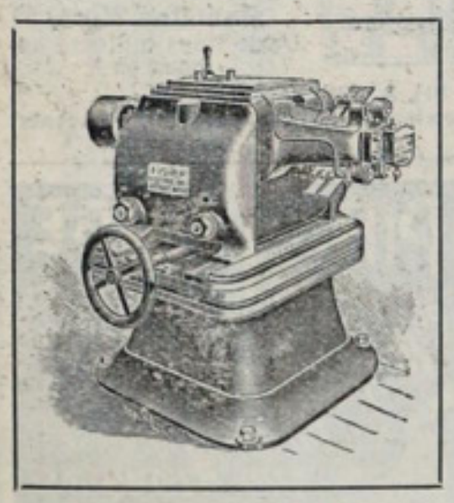

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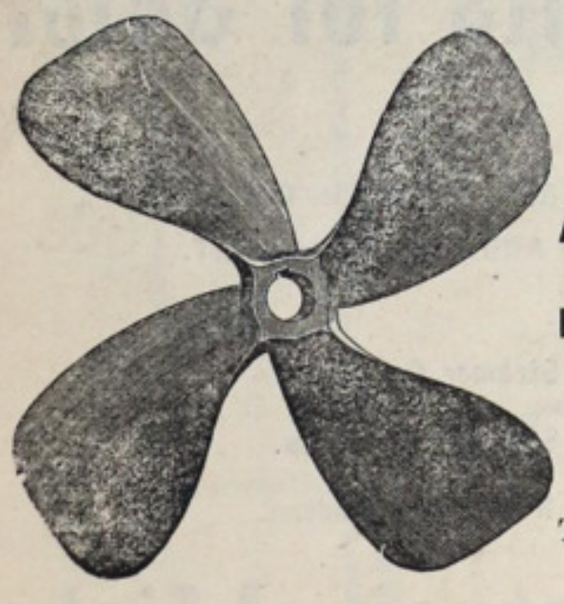

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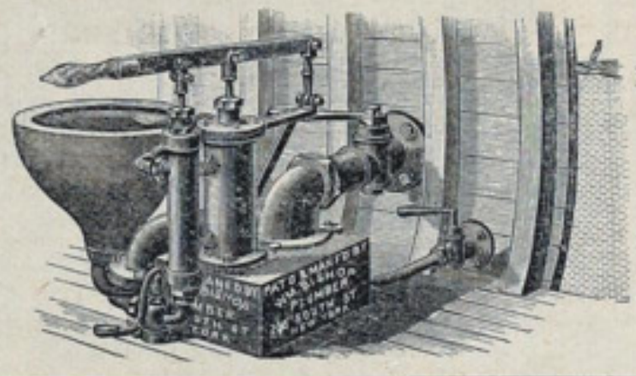

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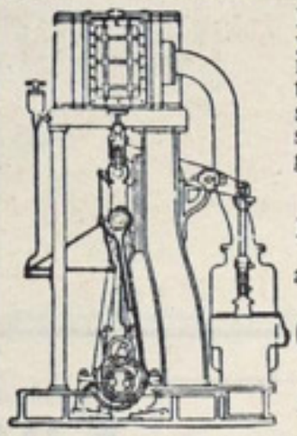

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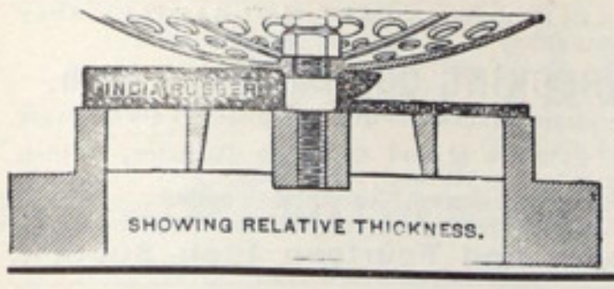

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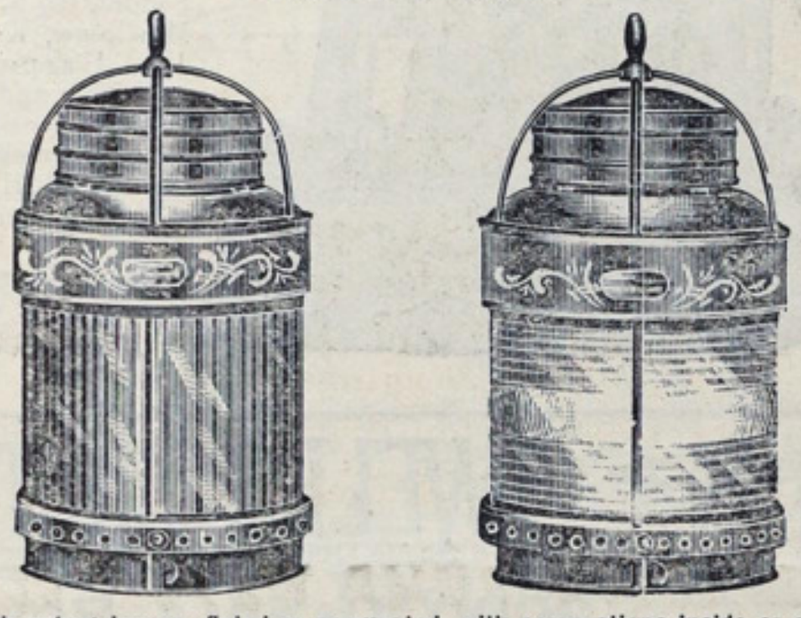
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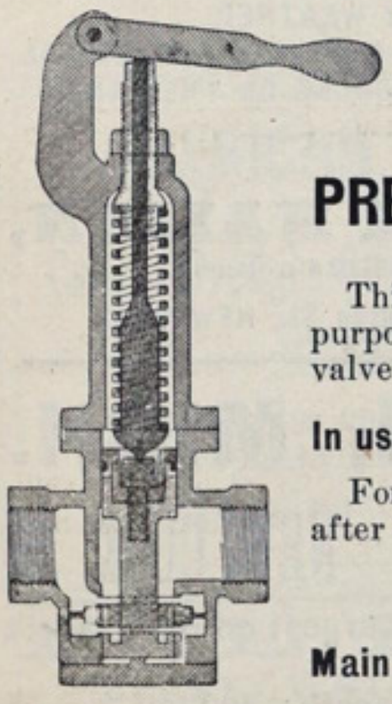
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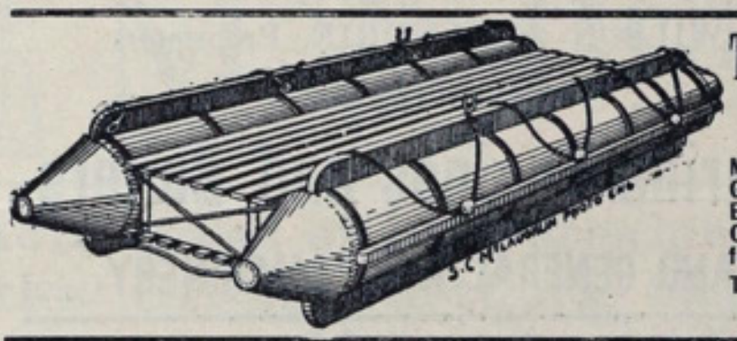
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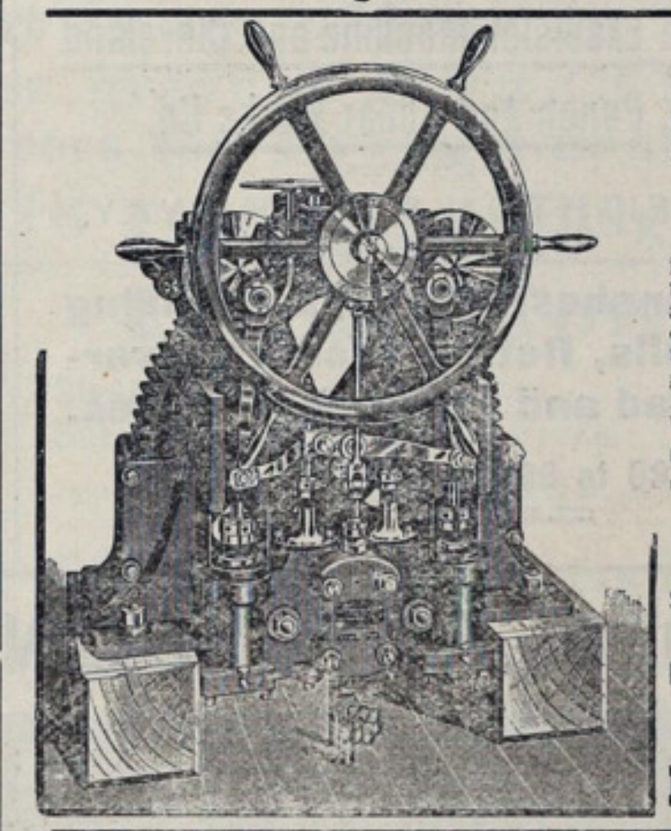
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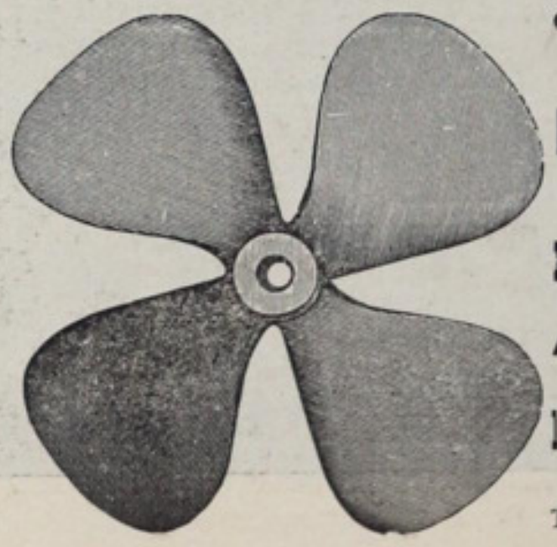
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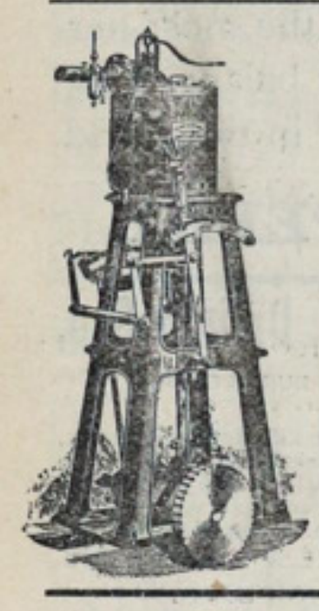

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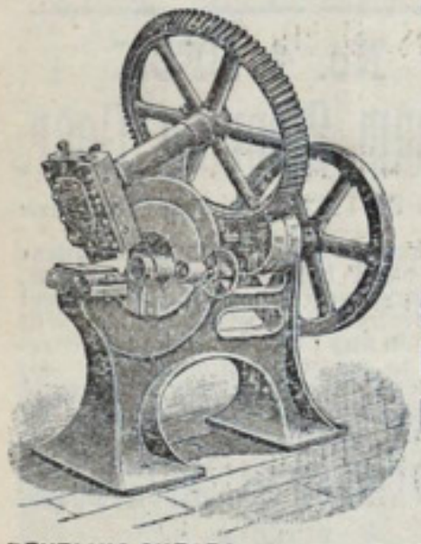

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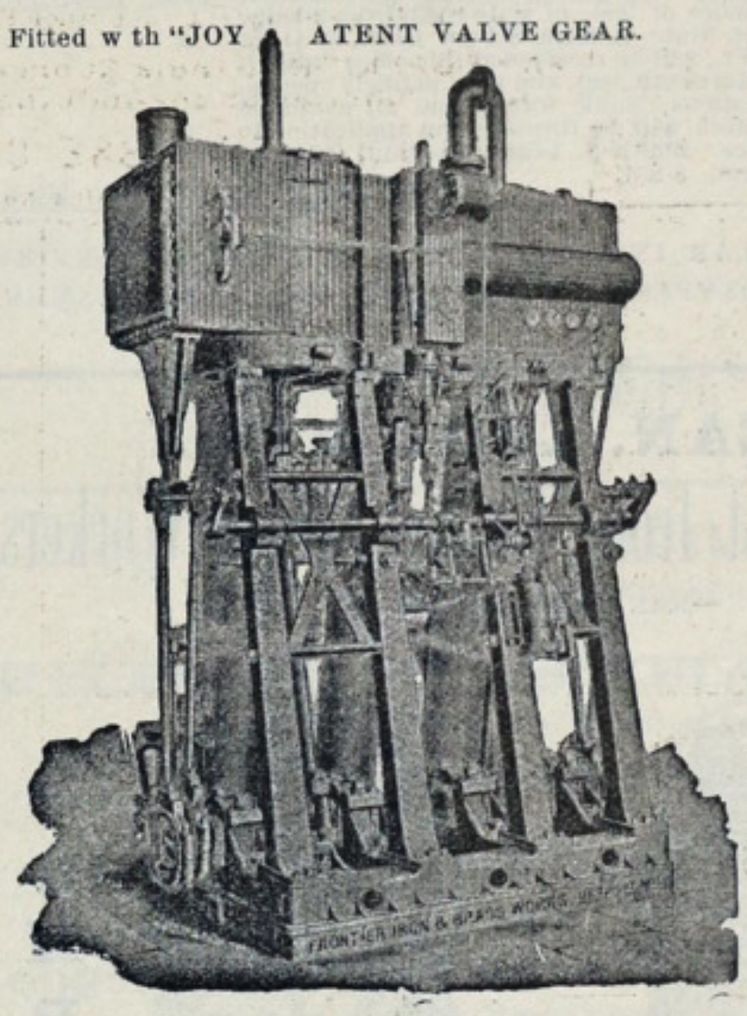

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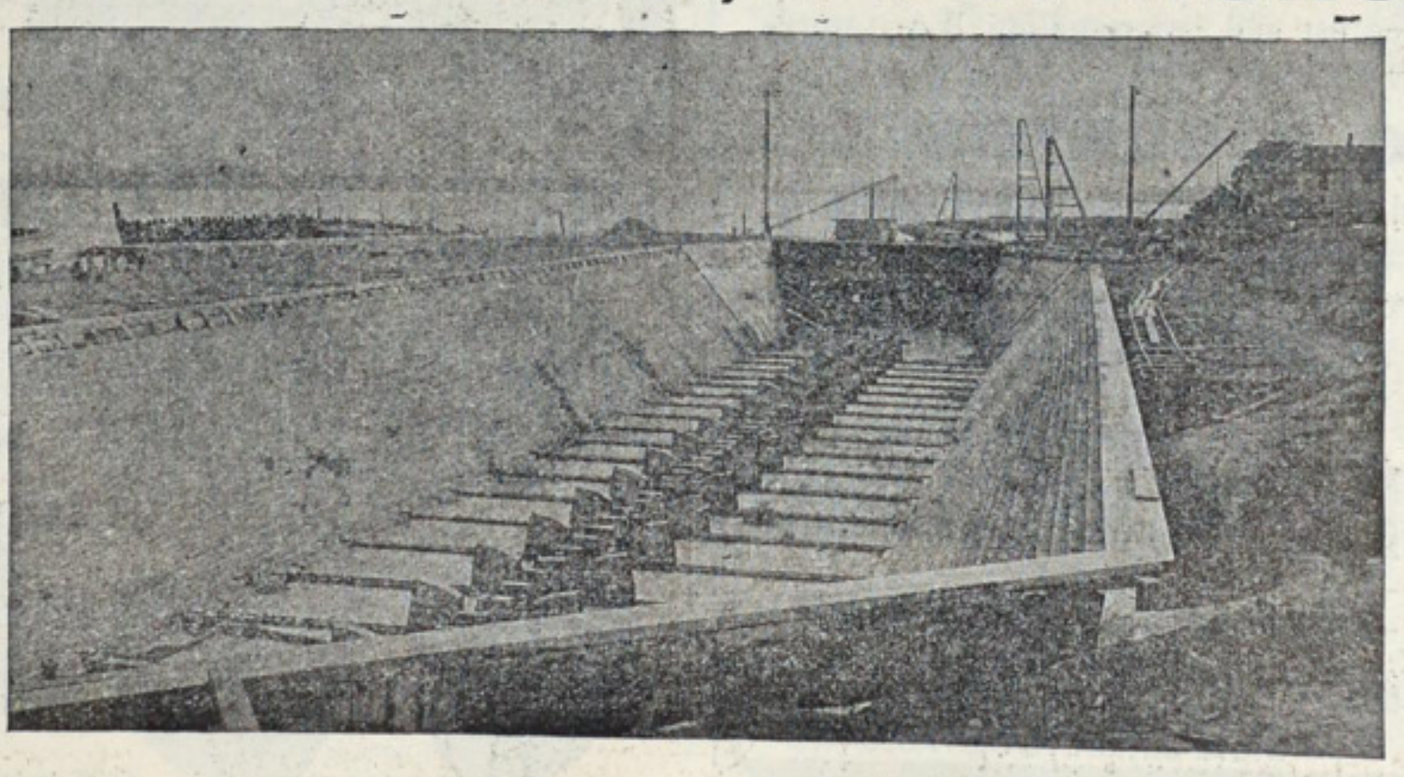

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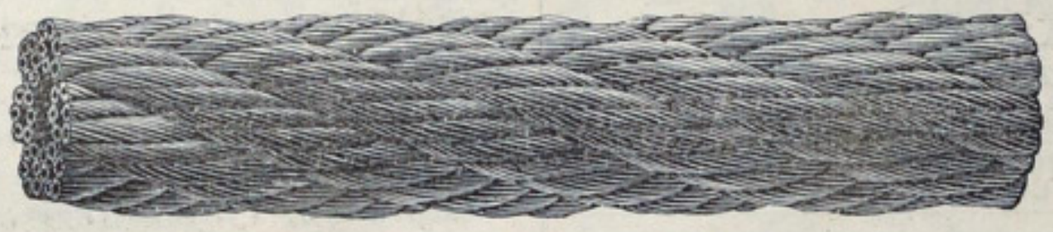

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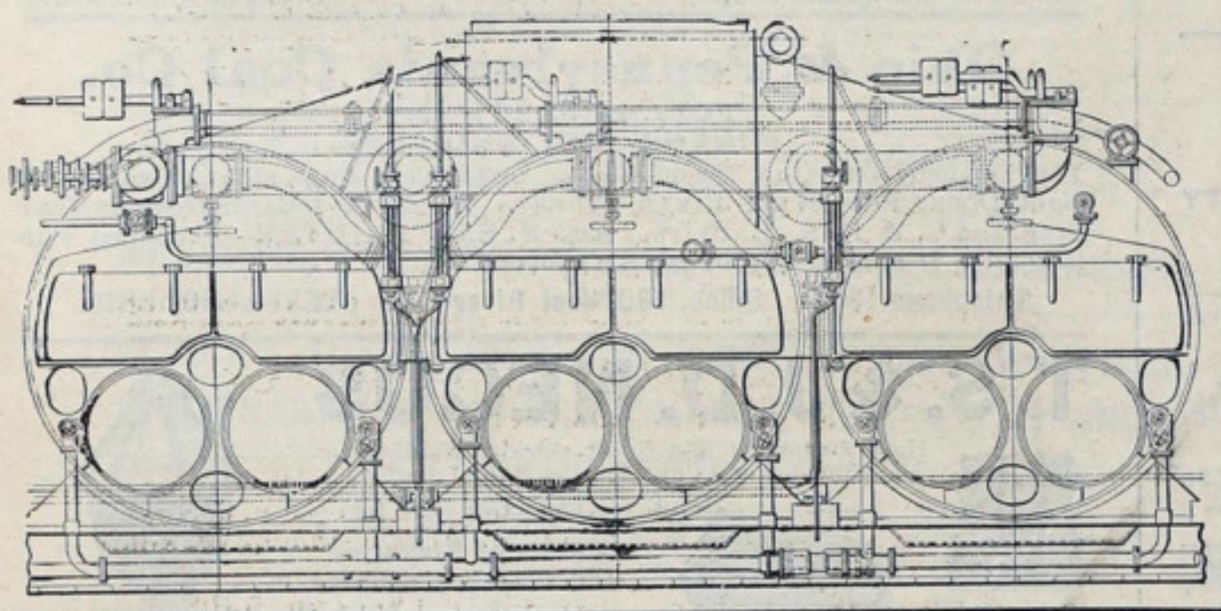

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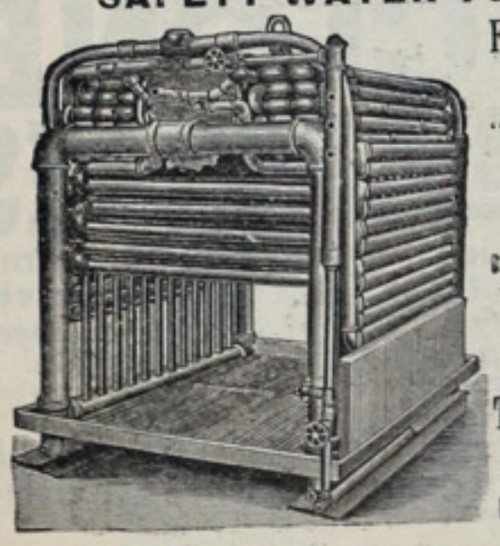

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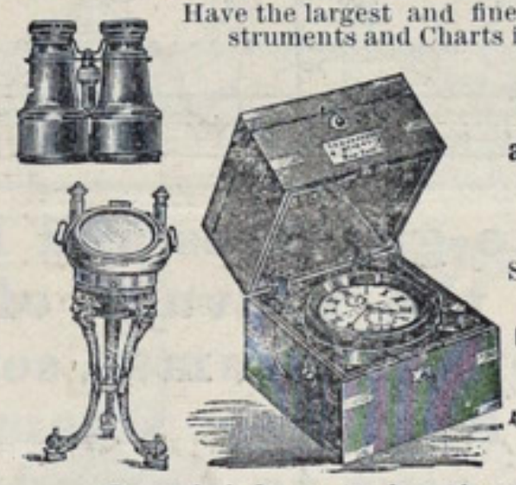

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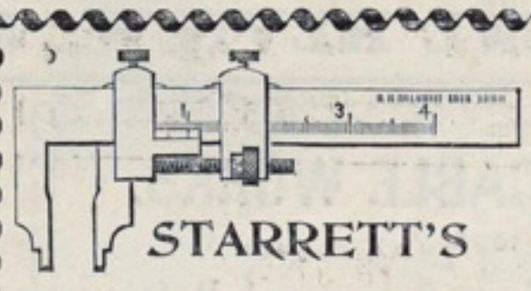

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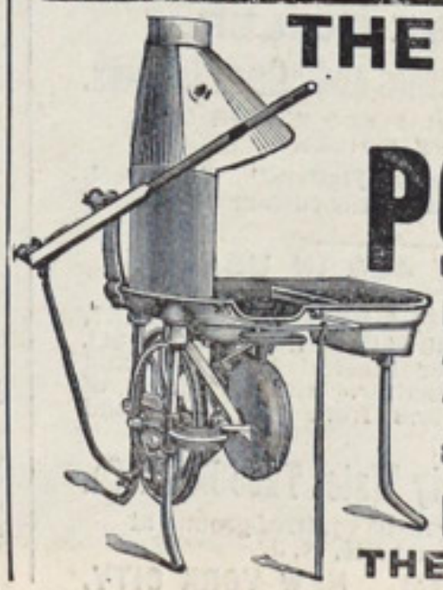

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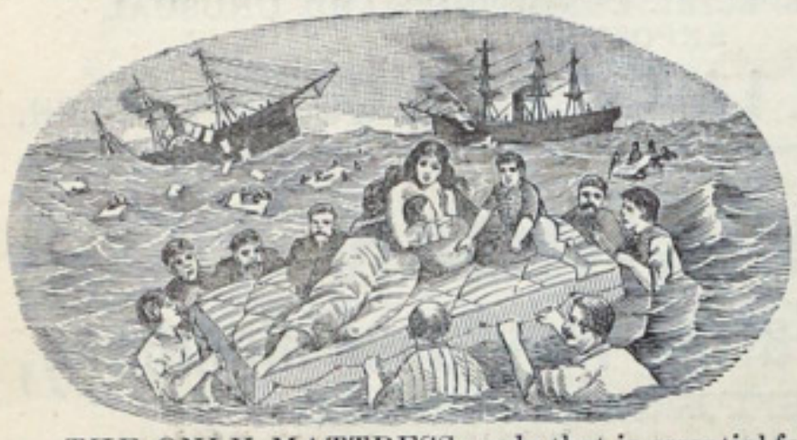

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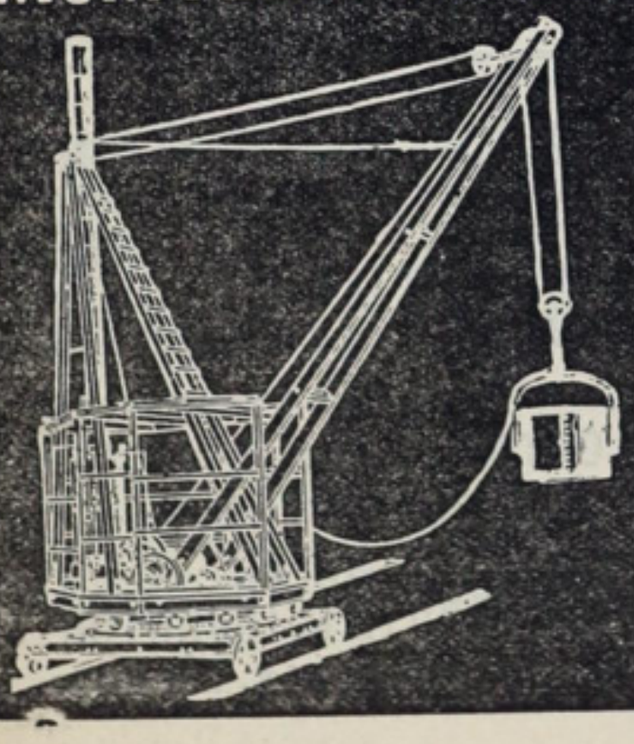

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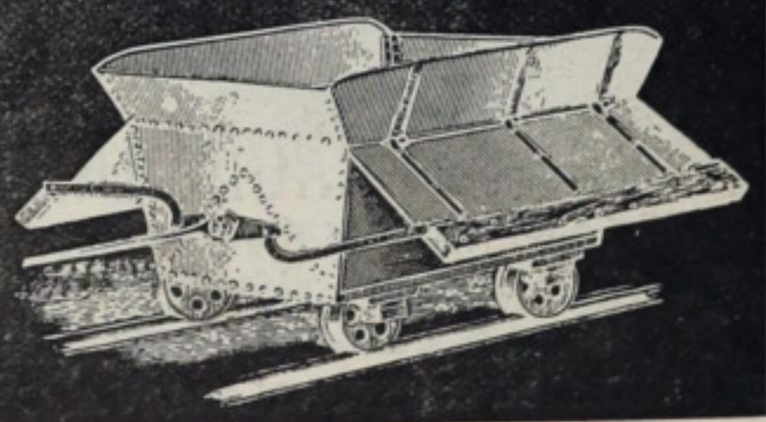

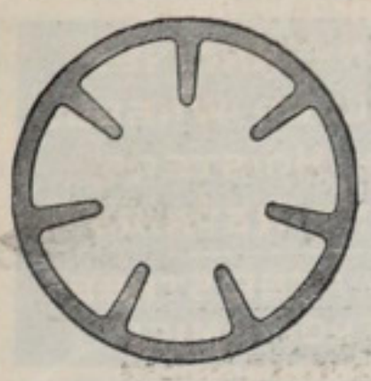

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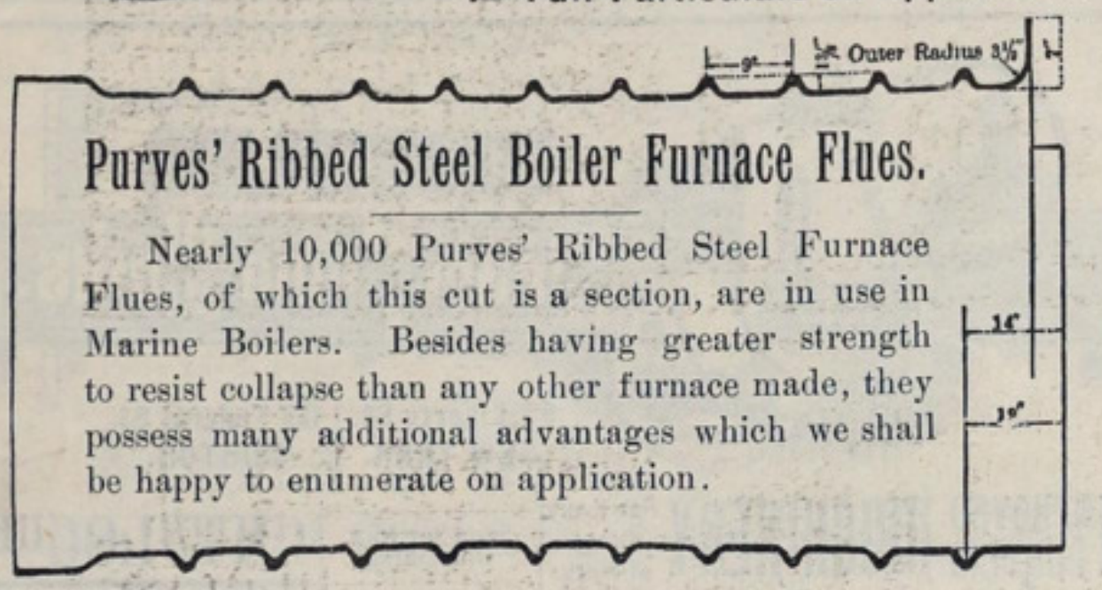

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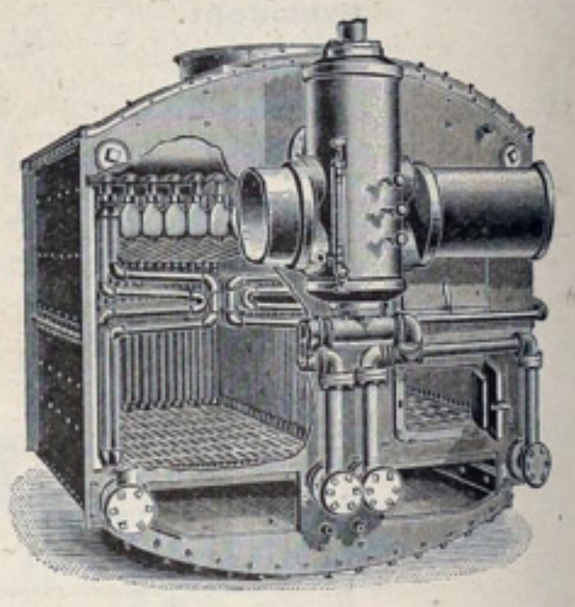

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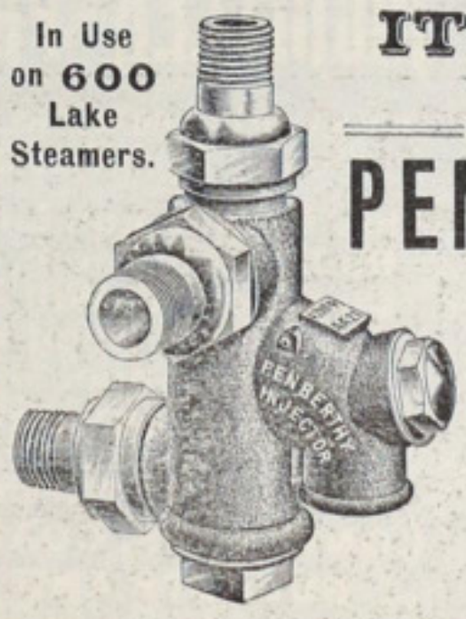

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